

WEIGHTS, MEASURES AND CONVERSION FACTORS

Weights and Measures and Conversion Factors

Bushel Weights:

Wheat & Soybeans = 60 lbs.
Corn, Sorghum & Rye = 56 lbs.
Barley (grain) = 48 lbs.; Malt - 34 lbs.
Oats = 32 lbs.

1,000 Kilograms Equals:

36.7437 bu. Wheat or Soybeans
39.3683 bu. Corn, Sorghum or Rye
45.9296 bu. Barley
68.8944 bu. Oats

Bushels to Metric Tons:

Wheat, Soybeans = bu. X .02721555*
Barley = bu. X .021772
Corn, Sorghum, Rye = bu. X .025400
Oats = bu. X .014515

Area:

1 Acre = .404694 Hectares
1 Hectare = 2.4710 Acres

1 Metric Ton Equals:

2204.622 Pounds (lbs.)
22.046 Hundredweight (cwt)
10 Quintals

Yields:

Wheat: bu. per acre X 0.6725
= quintals per hectare
Rye, Corn: bu. per acre X 0.6277
= quintals per hectare
Barley: bu. per acre X 0.5380
= quintals per hectare
Oats: bu. per acre X 0.3587
= quintals per hectare

* The preliminary 1999 Kansas wheat crop of 423.2 million bushels is equivalent to 11,518,000 metric tons.

WHEAT QUALITY 1999



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For Agriculture**

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Issued September 1999

FOREWORD

The Kansas Wheat Commission joins the Kansas Department of Agriculture in presenting this 1999 Wheat Quality Report. This information is of vital interest to wheat producers, as well as domestic and foreign buyers.

The basic quality information is compiled by summarizing data from inspection certificates for railroad car samples of Kansas wheat moving from first point of sale. In addition, truckloads converted to carlot equivalents were included and account for approximately 12 percent of the total volume reported. Determinations of protein percentage, test weight per bushel, and other grade factors were made by the Kansas Grain Inspection Service, Inc.

The Kansas Wheat Quality profile section is a summary of milling quality information by variety for the current year's Kansas wheat crop. Enumerators from Kansas Agricultural Statistics made the field collection of samples used in this project. We are indebted to the Department of Grain Science and Industry, Kansas State University, for milling and evaluating laboratory results from the samples tested on a very tight time schedule.

We also want to give a special word of thanks to the wheat farmers throughout Kansas who cooperated in the objective yield survey and allowed wheat samples to be collected.

Eldon J. Thiessen
State Statistician

John Bunck, Chairman
Kansas Wheat Commission

Copies of this bulletin are available upon request to the Administrator, Kansas Wheat Commission, 2630 Claflin Road, Manhattan, Kansas 66502 or the State Statistician, 632 SW Van Buren, Room 200, P.O. Box 3534, Topeka, Kansas 66601-3534.

This bulletin is also available on the internet at the Kansas Agricultural Statistics homepage at <http://www.nass.usda.gov/ks/>

KANSAS WHEAT QUALITY 1999

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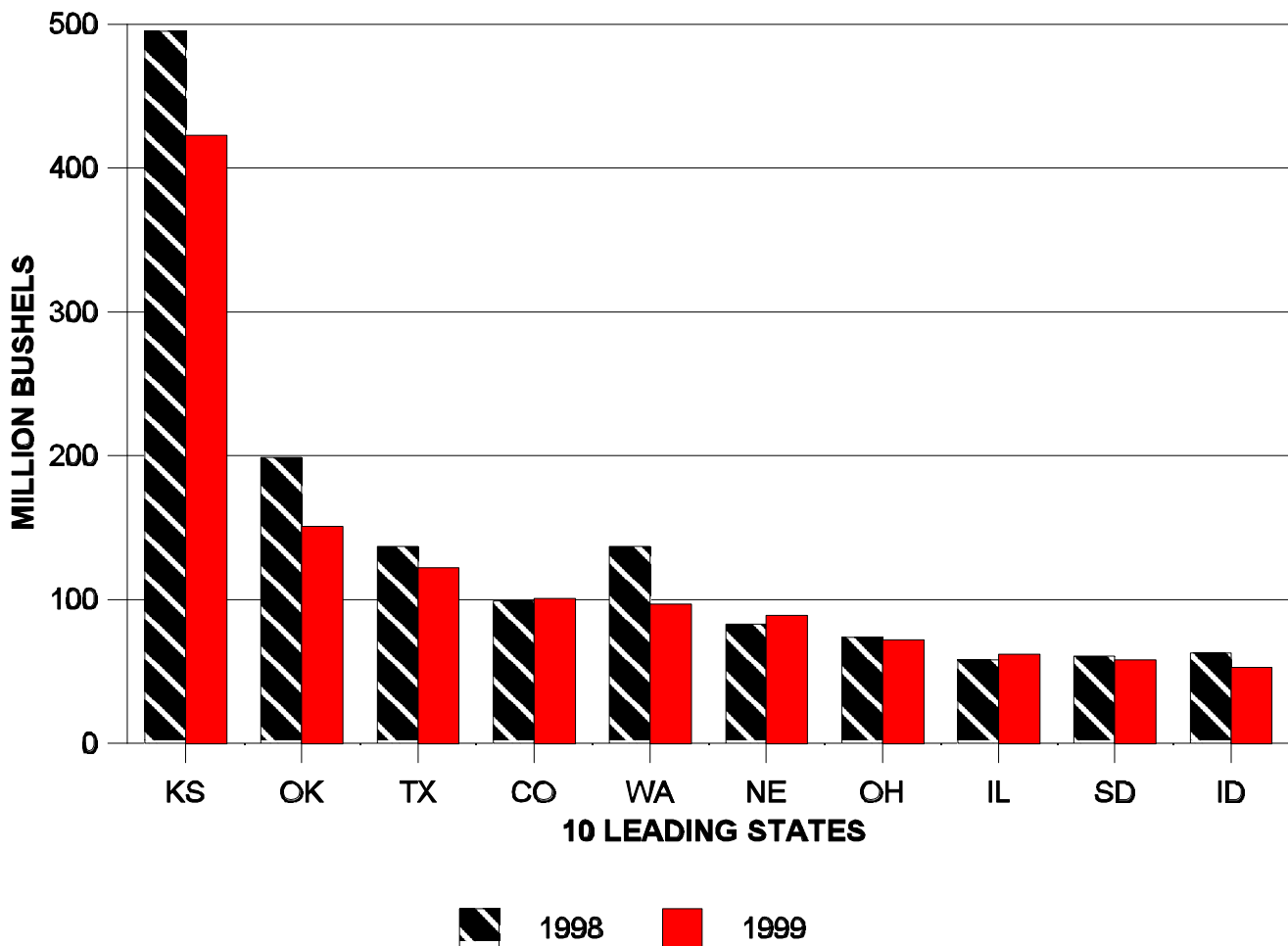
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WHEAT SITUATION

World wheat production as of August 1, 1999 is expected to total 575.9 million metric tons (21.2 billion bushels), down 2 percent from a year ago. Total U.S. wheat production, at 63.0 million metric tons, will be down 9 percent from a year ago and will account for about 11 percent of the world total. Winter wheat production in U.S. is estimated at 46.0 million metric tons, or about 73 percent of the total U.S. wheat production. Kansas, with an estimated 11.5 million metric tons of winter wheat, will account for 25 percent of the U.S. winter wheat production. This output represents 18 percent of the total U.S. wheat output and 2 percent of the world total.

WINTER WHEAT PRODUCTION

LEADING STATES - 1998-99



The following table, which is a summary of data from numerous survey sources, shows the average acres planted to wheat per farm in the fall of 1998 for harvest in 1999. These data provide a good look at the size of operations in different areas of the State. Farmers who planted 500 or more acres of wheat made up 21.6 percent of all wheat farms but accounted for 63 percent of acres planted in the fall of 1998. Comparable figures from the 1989 Wheat Quality Bulletin had farms planting 500 acres or more to wheat accounting for 19.4 percent of all wheat farms and 56 percent of the 12,400,000 acres of wheat planted in 1988 for harvest in 1989.

WHEAT PLANTED IN KANSAS FOR 1999 HARVEST, BY SIZE GROUPS

Acres of Wheat Planted per Farm	Number of Farms	Percent of Farms	Acres of Wheat Planted
1-24	3,500	9.3	41,500
25-74	7,200	19.5	278,700
75-199	8,800	23.9	914,100
200-499	9,500	25.7	2,472,900
500-749	3,600	9.7	1,774,800
750-999	1,800	4.7	1,237,600
1,000-1,999	2,300	6.3	2,503,300
2,000-2,999	200	0.7	498,100
3,000 +	100	0.2	279,000
State	37,000	100.0	10,000,000

The largest farms and, consequently, the largest average acres of wheat planted, are located in the western area of the State. Greeley County led the State with an average of 1,114 acres, followed by Hamilton County with 1,077 acres, and Kearny County with 918 acres. State-wide, the average of 391 acres of wheat planted per farm compares with 436 acres in 1998 and 470 acres in 1997.

ACRES OF WHEAT PER FARM PLANTING WHEAT, 1999 HARVEST

Cheyenne 401	Rawlins 446	Decatur 462	Norton 370	Phillips 345	Smith 321	Jewell 328	Republic 243	Washington 203	Marshall 138	Nemaha 73	Brown 91	Donipah 53
Sherman 579	Thomas 540	Sheridan 366	Graham 438	Rooks 405	Osborne 399	Mitchell 559	Cloud 297	Clay 200	Riley 116	Pottaw 53	Jackson 42	Atchison 64
Wallace 519	Logan 654	Gove 485	Trego 395	Ellis 323	Russell 335	Lincoln 337	Ottawa 497	Dickins 277	Geary 188	Wabaun 47	Shawnee 115	Jefferson 60
Greeley 1,114	Wichita 669	Scott 617	Lane 630	Ness 496	Rush 424	Barton 374	Ellsworth 371	Saline 431	Morris 158	Lyon 72	Osage 65	Douglas 70
Hamilton 1,077	Kearny 918	Finney 590	Hodgeman 589	Pawnee 553	Stafford 538	Reno 336	Rice 485	McPherson 302	Marion 236	Chase 144	Coffey 111	Franklin 49
Stanton 731	Grant 496	Haskell 801	Gray 421	Edwards 449	Pratt 581	Kingman 538	Harvey 249	Sedgwick 356	Butler 197	Greenwood 80	Anderson 151	Miami 49
Morton 845	Stevens 635	Seward 664	Meade 411	Clark 887	Kiowa 444	Barber 618	Harper 740	Sumner 601	Cowley 237	Elk 73	Neosho 165	Linn 51
					Comanche 545					Chautauq 176	Woodson 101	Johnson 99
											Allen 157	Leavenworth 46
											Wilson 132	Wyan 46
											Montgom 171	Bourbon 79
											Labette 148	Crawford 98
											Cherokee 208	

U.S. WHEAT SUPPLY AND DISAPPEARANCE, 1991-99

U.S. wheat supplies for the 1999/00 season are expected to be 3,364 million bushels, virtually unchanged from last year. Beginning stocks, at 945 million bushels, are up 31 percent from a year ago. Estimated U.S. wheat production as of August 1, at 2,315 million bushels, is down 9 percent from last year. Disappearance is expected to total 2,480 million bushels, compared with 2,431 million bushels for 1998. Domestic use is expected to account for 1,330 million bushels, down 4 percent from the 1998/99 crop. Exports, forecast at 1,150 million bushels, are 10 percent above a year ago. Carry-over at the end of the crop year is expected to total 884 million bushels, 6 percent below the 1998/99 level.

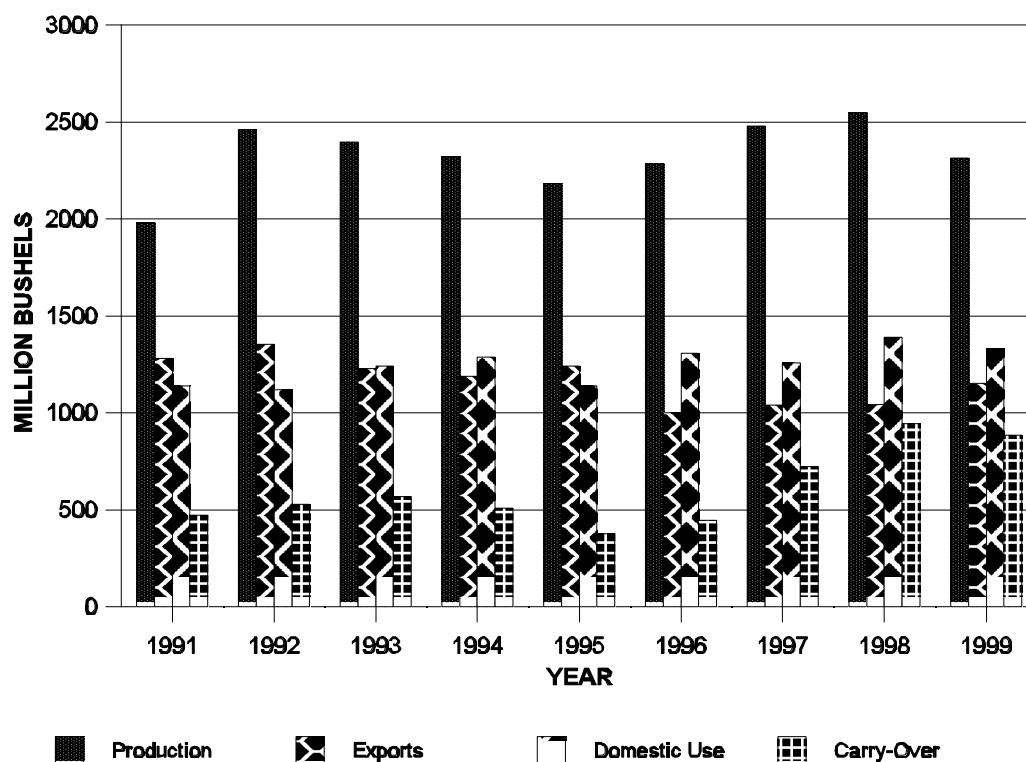
U.S. WHEAT SUPPLY AND DISAPPEARANCE, 1991-99

Year Beginning June 1	Supply			Disappearance			Ending Stocks May 31
	Beginning Stocks	Production	Total <u>1/</u>	Domestic Use	Exports	Total <u>2/</u>	
1991/92	866	1,981	2,888	1,137	1,280	2,416	472
1992/93	472	2,459	3,001	1,118	1,354	2,472	529
1993/94	529	2,396	3,036	1,240	1,228	2,467	568
1994/95	568	2,321	2,981	1,287	1,188	2,475	507
1995/96	507	2,183	2,757	1,140	1,241	2,381	376
1996/97	376	2,285	2,753	1,308	1,001	2,310	444
1997/98	444	2,481	3,020	1,257	1,040	2,298	722
1998/99	722	2,550	3,376	1,389	1,042	2,431	945
1999/00 <u>3/</u>	945	2,315	3,364	1,330	1,150	2,480	884

1/ Includes imports. 2/ Totals may not add due to rounding. 3/ Preliminary.

U.S. WHEAT SUPPLY & DISAPPEARANCE

1991-99



KANSAS WHEAT STOCKS

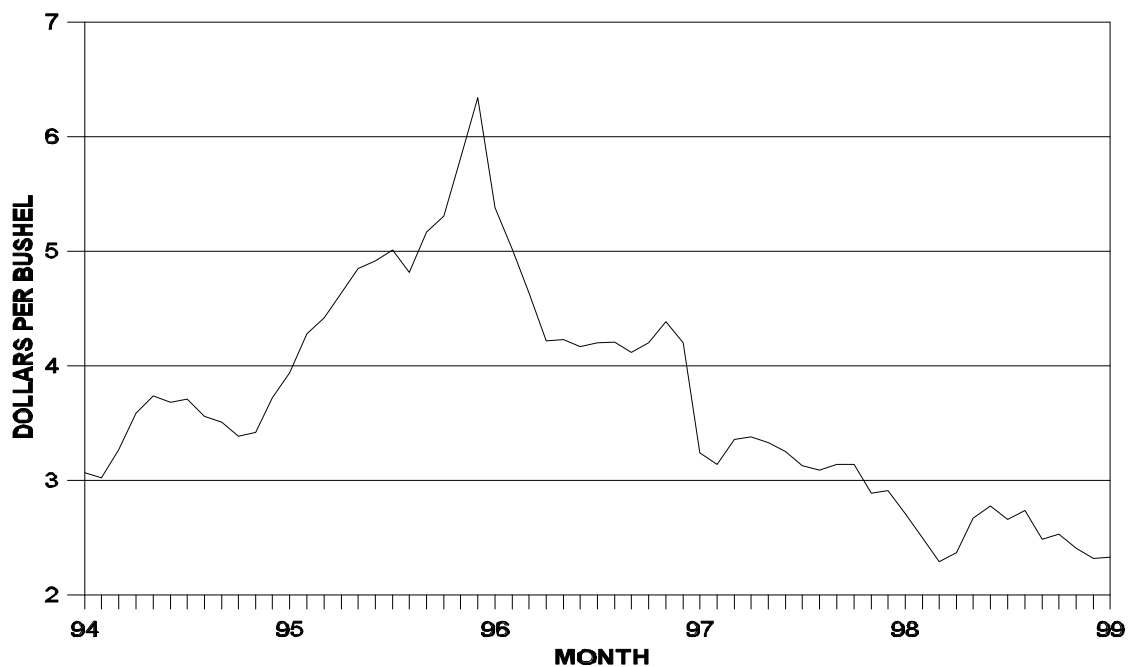
Marketing Year	September 1	December 1	March 1	June 1
1993/94	313,888	210,996	123,923	60,323
1994/95	305,233	216,388	115,096	51,968
1995/96	236,431	167,201	92,753	40,048
1996/97	179,327	109,012	96,564	33,833
1997/98	351,810	244,197	213,301	106,901
1998/99	379,253	271,381	226,800	148,561

MONTHLY MARKETINGS OF KANSAS WHEAT, 1993-98

Month	1993-94	1994-95	1995-96	1996-97	1997-98	5-Year Average
----- Percent -----						
June	5	21	5	10	7	10
July	25	23	33	33	34	30
August	15	13	15	7	10	12
September	10	9	13	6	4	8
October	9	5	8	4	4	6
November	9	3	3	5	4	5
December	8	8	9	8	7	8
January	9	6	6	8	8	7
February	3	3	3	6	5	4
March	3	4	3	7	6	5
April	2	2	1	4	6	3
May	2	3	1	2	5	2

KANSAS WHEAT PRICES

JUNE 1994-JUNE 1999



HIGHLIGHTS OF THE 1999 CROP

The 1999 wheat crop, at 423.2 million bushels, was down 14 percent from the 1998 crop. Wheat planted acres at 10.0 million, were down 7 percent from 1998, while acres harvested for grain at 9.2 million, were down 900,000 acres from 1998. Yield for the 1999 crop averaged 46 bushels per acre, the second highest yield, tied with 1997 and 3 bushels below the record of 49 bushels set in 1998.

Dry conditions slowed the seeding of the 1999 wheat crop, only 21 percent of the crop had been seeded by the end of September, compared with 31 percent for the 1998 crop and the 5 year average, with nine percent of the planted acreage emerged, compared to 14 percent for the 1998 crop and 13 percent average. Some producers reseeded acres in mid-October as a result of hard rains. Seeding continued to progress slowly throughout October, finally nearing completion by the first of November. Emergence was slightly behind normal the first of November but was near complete emergence by Thanksgiving.

A general lack of snowfall across the State, combined with mild temperatures, resulted in very little snow cover for the crops. During the latter part of December, the mild temperatures gave way to extreme cold. Daytime highs from the low fifties were replaced by highs ranging from single digits to mid-teens. Despite the sharp drop in temperatures, it appeared very little freeze damage had occurred during December and early January. By the end of January, the crop condition had declined only slightly. During late January, the mild temperatures gave way to light snowfall in some areas. Daytime highs ranged from below freezing to upper seventies. Very little freeze and wind damage was reported to the crop. The winter wheat crop began to break dormancy by the end of February and the crop condition improved slightly from January. Topsoil moisture remained adequate throughout the winter. Winter freeze damage was reported as 1 percent moderate, 5 percent light and 92 percent with no damage. The 1999 hard red winter wheat crop was 36 percent jointed as of April 5th, ahead of 1998 at 17 percent and a five-year average of 25 percent. Some fields were showing signs of nitrogen deficiency. Mid-April temperature fell below freezing, bringing with it concerns of possible freeze damage to the crop. In addition, heavy rains in some areas left standing water in fields. The 1999 crop was reported in mostly good condition throughout the spring. The wheat was 99 percent headed by June 1st, slightly ahead of the 1998 crop and the average, 18 percent of the crop had started to turn. Insect infestation was minimal and disease infestations was 2 percent severe, 11 percent moderate, 27 percent light and 60 percent with no disease infestation.

Some localized severe hail storms occurred during the first week of June, causing significant damage to the crop in isolated areas. Numerous damaged fields were baled for hay instead of being harvested for grain, others were reported with extreme damage and low yields expected. Harvest of the 1999 crop began in the Southern areas of the State the week of June 21st. The next week, harvest was slowed by rainy weather and muddy conditions across most of the State. The northeast district was extremely hard hit, causing flooding in some counties. With excess rainfall, producers became concerned about the deterioration in the quality of the crop. Dark heads were observed in some fields, as well as heads sprouting. Harvest plagued by muddy fields and rainy conditions progressed behind both the 1998 crop and the 5 year average. By the July 4th weekend, 44 percent of the crop had been harvested, compared to 93 percent in 1998 and the average of 66 percent. Harvest was complete by the third week of July.

DOMESTIC UNITS

Year	Planted Acres	Harvested Acres	Yield per Acre	Production	Test Weight	Protein <u>1/</u>	Moisture
	----- 1,000 -----		Bushels	1,000 Bu.	Lb./Bu.	--- Percent ---	
1990	12,400	11,800	40.0	472,000	60.7	12.2	10.5
1991	11,800	11,000	33.0	363,000	59.9	12.9	11.2
1992	12,000	10,700	34.0	363,800	59.4	12.4	12.6
1993	12,100	11,100	35.0	388,500	59.8	11.4	12.4
1994	11,900	11,400	38.0	433,200	60.3	12.1	11.4
1995	11,700	11,000	26.0	286,000	58.4	12.3	11.1
1996	11,800	8,800	29.0	255,200	60.2	13.3	12.3
1997	11,400	10,900	46.0	501,400	60.6	11.8	11.9
1998	10,700	10,100	49.0	494,900	61.5	11.5	11.2
1999	10,000	9,200	46.0	423,200	60.2	11.5	12.2

1/ All protein data shown have been converted to a 12% moisture base.

METRIC UNITS

Year	Planted Hectares	Harvested Hectares	Yield per Hectare	Production	Test Weight <u>1/</u>
	----- 1,000 -----		Metric Tons	1,000 MT	Kg/Hl
1990	5,018	4,775	2.7	12,846	78.2
1991	4,775	4,452	2.2	9,879	77.2
1992	4,856	4,330	2.3	9,901	76.5
1993	4,897	4,492	2.4	10,573	77.0
1994	4,816	4,614	2.6	11,790	77.7
1995	4,735	4,452	1.7	7,784	75.2
1996	4,775	3,561	2.0	6,945	77.6
1997	4,614	4,411	3.1	13,646	78.1
1998	4,330	4,087	3.3	13,469	79.2
1999	4,047	3,723	3.1	11,518	77.6

1/ Kilograms/Hectoliter = 1.28841 X (lbs./bu.).

WHEAT QUALITY DATA - KANSAS GRAIN INSPECTION CERTIFICATES

IMPORTANCE OF WHEAT QUALITY

The quality of wheat as characterized by protein content, strength of gluten, weight per bushel, amount of dockage, grades and grade defects, milling data, and physical dough analysis has an important impact on the use of wheat for flour and, hence, its price in the market place.

This report on wheat quality, issued by Kansas Agricultural Statistics, helps farmers appraise the quality of the wheat crop being marketed and aids buyers in locating wheat with the desired characteristics.

Information on wheat protein content, weight per bushel, varieties, and grade defects helps producers of high quality grain obtain better prices. The grain trade, in turn, is in a better position to know the areas in which the quality and gluten strength of wheat meet their requirements and direct their purchases accordingly. Thus, the reports facilitate pricing and marketing of the crop. Publication of wheat quality data by counties and agricultural statistics districts as soon as the new crop comes on the market provides everyone with current information coinciding with the harvest period, thus maximizing benefits to producers, grain buyers, and the wheat industry in general.

The following table shows the grading standards used by the Kansas Grain Inspection Service, Inc. in grading samples of hard red winter wheat. This bulletin is based on a summary of samples graded by the Kansas Grain Inspection Service, Inc.

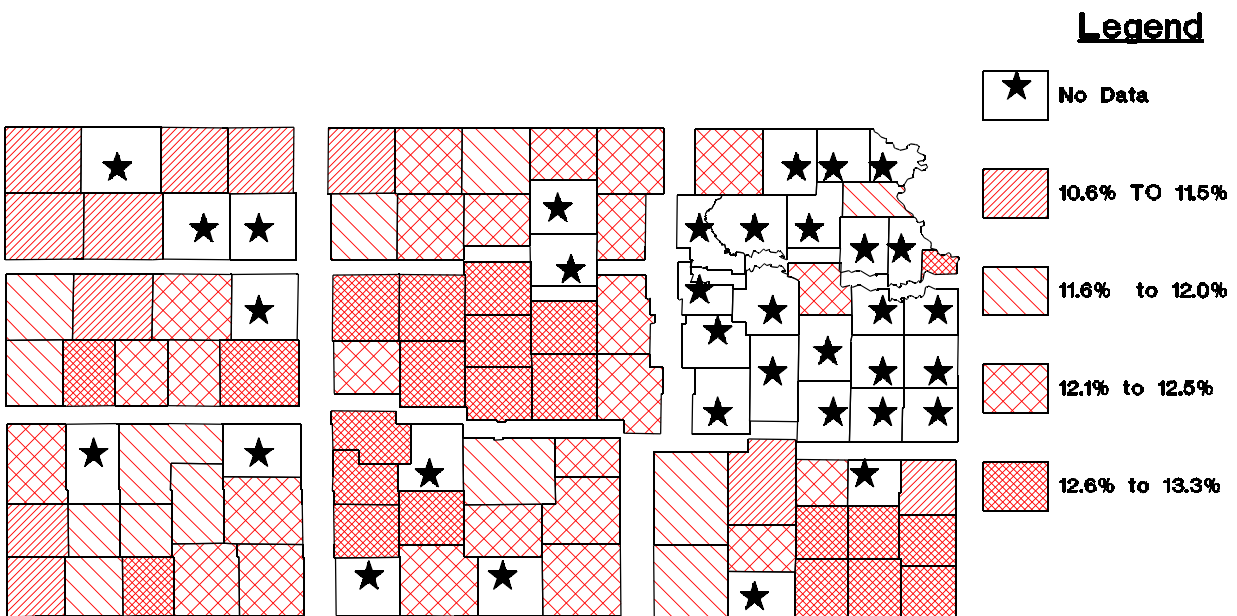
GRADES AND GRADE REQUIREMENTS FOR HARD RED WINTER WHEAT

Grade	Minimum Weight per Bushel	Maximum Limits:						
		Defects					Wheat of Other Classes	
		Heat Damaged Kernels	Damaged Kernels (Total)	Foreign Material	Shrunk and Broken Kernels	Total Defects	Contrasting Classes	Wheat of Other Classes (Total)
	Pounds	----- Percent -----						
1	60.0	0.2	2.0	0.4	3.0	3.0	1.0	3.0
2	58.0	0.2	4.0	0.7	5.0	5.0	2.0	5.0
3	56.0	0.5	7.0	1.3	8.0	8.0	3.0	10.0
4	54.0	1.0	10.0	3.0	12.0	12.0	10.0	10.0
5	51.0	3.0	15.0	5.0	20.0	20.0	10.0	10.0

SAMPLE GRADE: Sample grade is wheat that does not meet the requirements for the grades U.S. Nos. 1, 2, 3, 4, or 5; or contains 31 or more insect-damaged kernels per 100 grams of wheat; or contains 4 or more stones or any number of stones which have an aggregate weight in excess of 0.1 percent of the sample weight, 1 or more pieces of glass, 2 or more crotalaria seeds, 1 or more castor beans, 3 or more particles of an unknown foreign substance or a commonly recognized harmful toxic substance, 1 or more rodent pellets, bird droppings, or equivalent quantity of other animal filth per 1,000 grams of wheat; or has a musty, sour, or commercially objectionable foreign odor except smut or garlic odor; or is heating or otherwise of distinctly low quality.

PROTEIN CONTENT

The average protein content of the 1999 Kansas wheat crop was 11.5 percent, unchanged from last year's crop. This year's protein is below the 10-year average of 12.4 percent. By district, protein content ranged from 10.9 percent in the south central and east central districts to 11.9 percent in the northwestern and west central districts. Greeley led all counties, averaging 13.5 percent protein. Second highest was a tie between Phillips and Barton counties, each of which averaged 12.5 percent protein. Protein content by variety from Wheat Objective Yield samples is shown beginning on page 28. See the map below for average protein content by county.

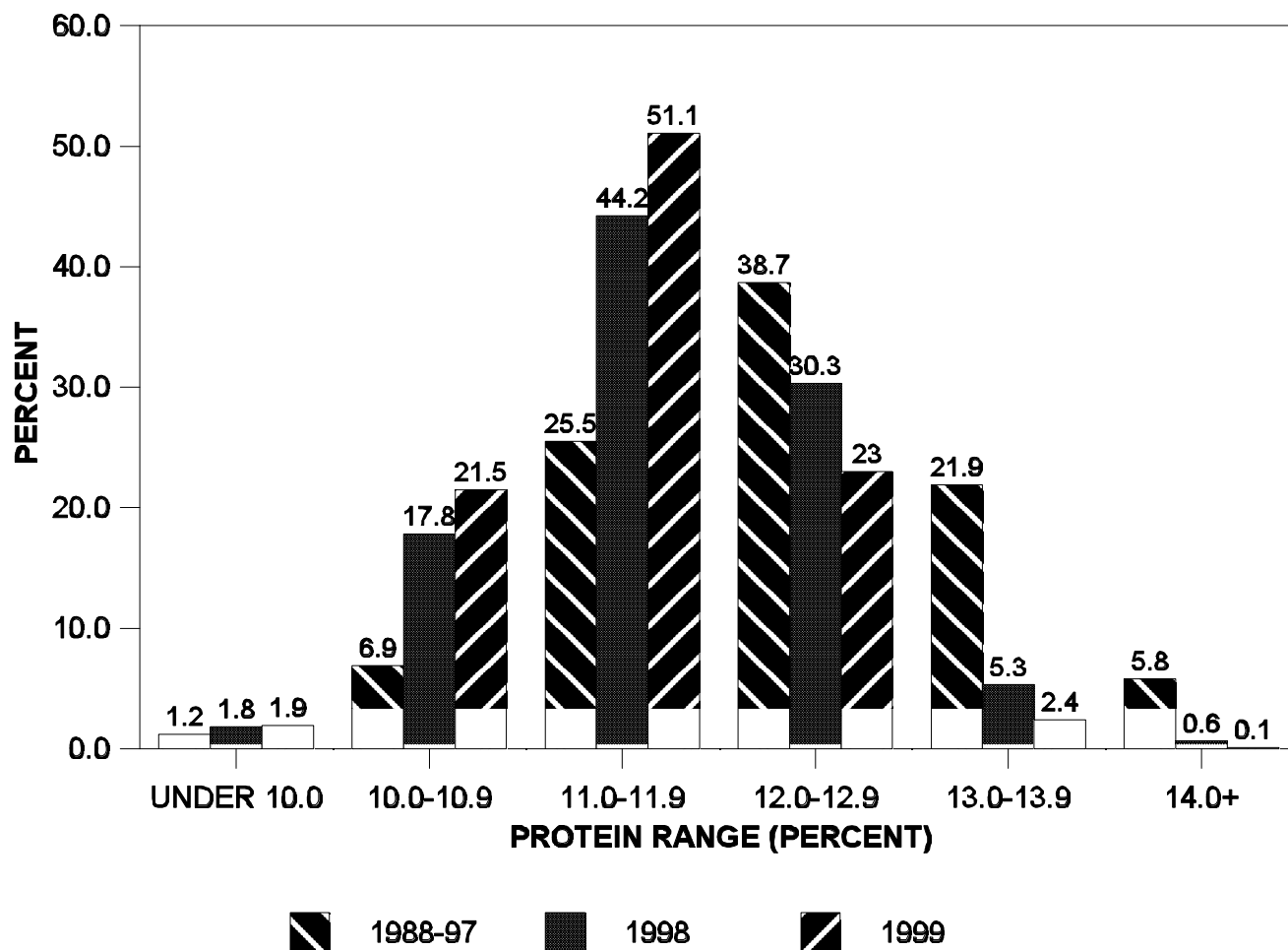


PROTEIN RANGES OF 1999 KANSAS WHEAT 1/

Districts	NW	WC	SW	NC	C	SC	NE	EC	SE	State
Production (000 bu.)	48,400	50,500	72,000	61,000	58,800	98,000	7,700	9,300	17,500	423,200
% Protein	----- Percent -----									
Under 10.0	0.1	0.3	2.3	0.1	0.1	3.7	31.3	0.0	0.6	1.9
10.0-10.9	9.1	12.4	12.3	11.9	26.6	32.4	33.8	69.1	43.4	21.5
11.0-11.9	52.6	62.8	51.8	56.5	48.8	45.2	22.5	30.3	56.0	51.1
12.0-12.9	32.6	23.2	31.8	29.5	22.4	15.5	6.2	0.6	0.0	23.0
13.0-13.9	5.5	1.0	1.8	1.9	2.1	3.1	2.5	0.0	0.0	2.4
14.0-Over	0.1	0.3	0.0	0.1	0.0	0.1	3.7	0.0	0.0	0.1
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

1/ Protein content adjusted to 12 percent moisture base.

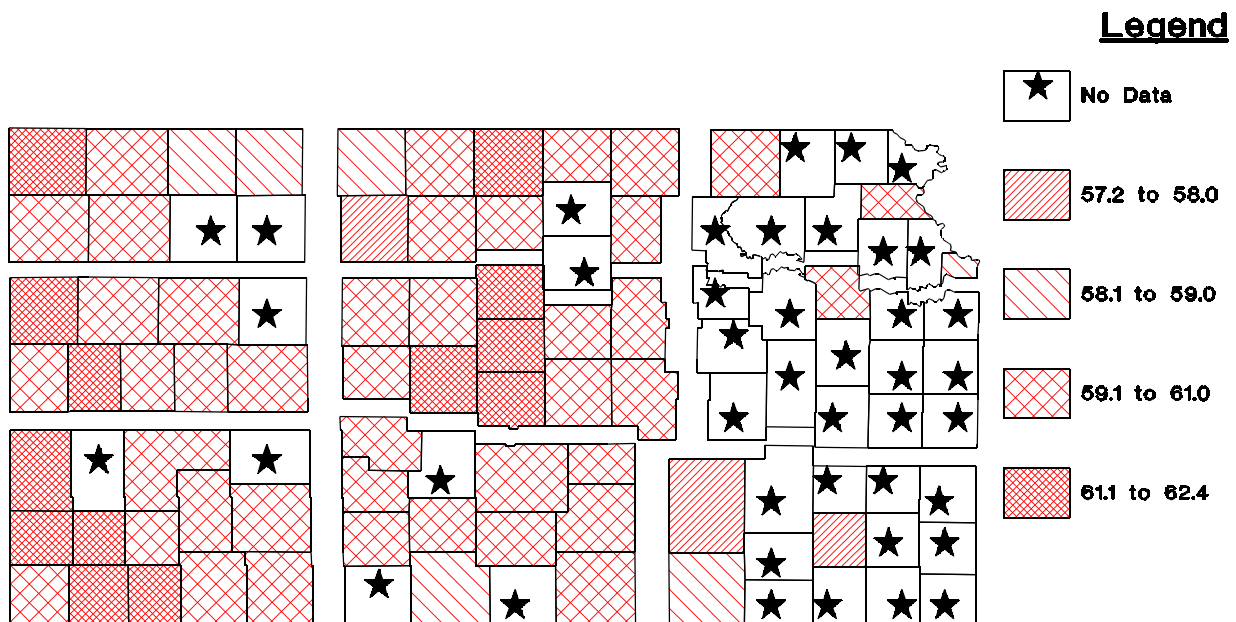
PROTEIN RANGES OF KANSAS WHEAT 1988-97, 1998, & 1999



TEST WEIGHT

The 1999 Kansas wheat crop averaged 60.2 pounds per bushel, compared with 61.5 pounds for the 1998 crop. The 10-year average for Kansas is 59.9 pounds per bushel. Harvest of the 1999 crop began in the Southern areas of the State the week of June 21st. By the July 4th weekend, 44 percent of the crop had been harvested, compared to 93 percent in 1998 and the average of 66 percent. Harvest was complete by the third week of July. By district, test weights fell in a range from 57.9 pounds in the southeast to 60.9 pounds in the southwest district. The west central and central districts tied for second highest in test weight at 60.4 pounds. Seward County, with a test weight of 62.4 pounds, was the highest in the State. Stevens County followed at 61.7 pounds. See the map below for average weight per bushel by county.

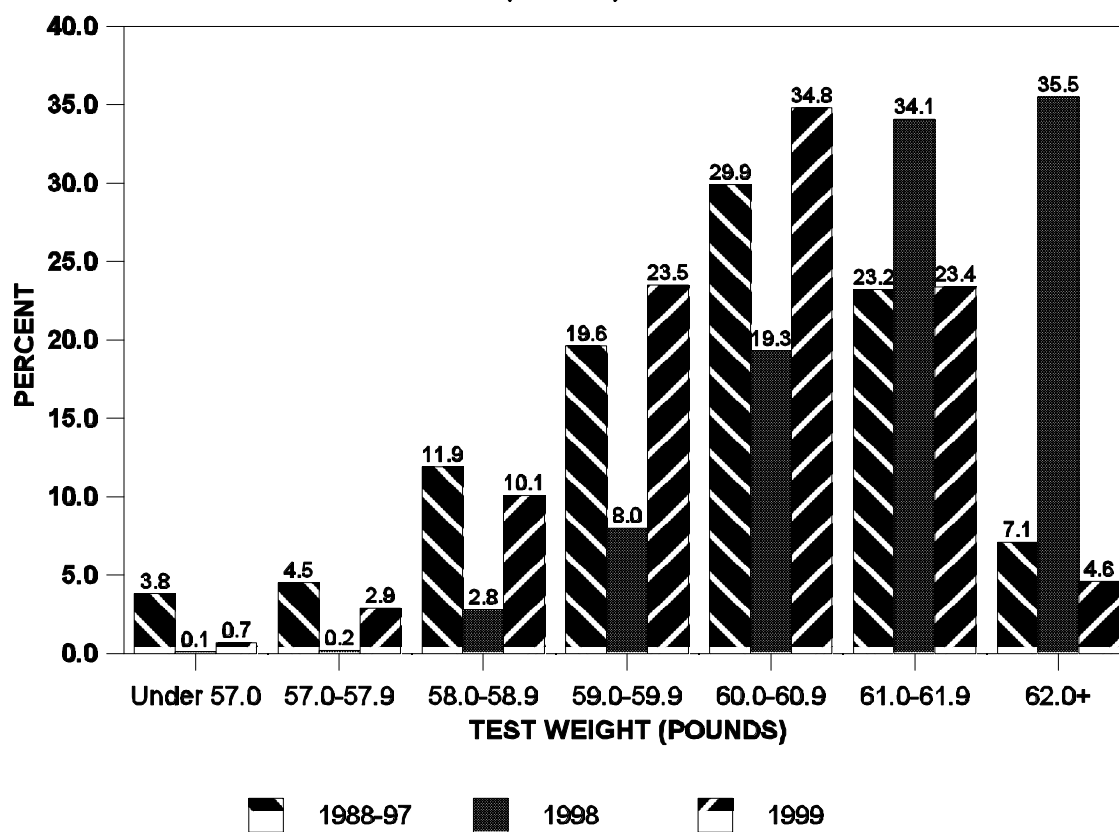
WHEAT TEST WEIGHT - 1999 (POUNDS PER BUSHEL)



RANGES OF 1999 TEST WEIGHTS

Districts	NW	WC	SW	NC	C	SC	NE	EC	SE	State
Production (000 bu.)	48,400	50,500	72,000	61,000	58,800	98,000	7,700	9,300	17,500	423,200
lb/bushel	----- Percent -----									
Under 55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.0-55.9	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
56.0-56.9	1.0	0.1	0.0	3.2	0.1	0.1	3.7	0.0	0.1	0.7
57.0-57.9	6.4	0.9	0.1	8.1	0.8	2.2	12.5	1.3	0.3	2.9
58.0-58.9	16.0	6.5	3.2	17.4	7.7	9.2	23.8	11.8	14.0	10.1
59.0-59.9	20.0	17.6	16.7	21.4	20.7	28.5	38.8	45.4	47.1	23.5
60.0-60.9	20.8	34.5	40.1	31.1	33.1	42.7	18.7	33.6	33.9	34.8
61.0-61.9	31.9	36.6	31.3	13.9	28.2	16.3	2.5	7.9	3.0	23.4
62.0-Over	3.9	3.8	8.6	4.7	9.4	1.0	0.0	0.0	1.6	4.6
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TEST WEIGHT RANGES OF KANSAS WHEAT 1988-97, 1998, & 1999



WEIGHT, PROTEIN, AND MOISTURE

County and District	Samples Tested 1999 <u>1/</u>	Test Weight			Protein Content <u>2/</u>			Moisture		
		Average 1987-97	1998	1999	Average 1987-97	1998	1999	Average 1987-97	1998	1999
CHEYENNE	246	59.9	60.9	61.3	12.5	13.0	12.1	11.1	11.4	11.2
DECATUR	234	59.7	61.3	58.6	12.6	12.3	11.9	11.0	11.4	10.9
GRAHAM	*	60.3	*	*	12.1	*	*	11.1	*	*
NORTON	193	59.8	62.4	59.0	12.5	11.4	11.5	11.2	11.3	11.2
RAWLINS	136	59.8	61.4	59.6	12.2	12.9	11.8	10.9	11.1	10.6
SHERIDAN	*	60.6	*	*	13.1	*	*	10.1	*	*
SHERMAN	717	59.8	60.9	60.9	12.5	12.4	11.4	11.4	11.7	11.0
THOMAS	360	59.9	61.1	59.4	12.6	12.2	12.4	11.1	11.6	11.2
NORTHWEST . . .	1,886	59.9	61.4	59.8	12.5	12.2	11.9	11.1	11.5	11.0
GOVE	239	59.9	62.0	60.2	12.5	11.6	11.4	11.1	10.7	12.1
GREELEY	7	60.8	61.5	59.3	11.5	10.6	13.5	11.2	11.2	11.9
LANE	13	60.0	61.9	60.6	12.0	11.3	12.0	11.3	10.6	12.5
LOGAN	743	60.3	61.6	60.3	12.3	12.0	11.5	10.9	11.5	11.5
NESS	20	60.0	61.8	60.1	12.0	11.4	11.7	11.8	11.7	13.3
SCOTT	676	60.3	61.9	60.6	12.2	11.8	11.8	11.5	11.0	12.1
TREGO	*	60.1	62.1	*	12.3	11.5	*	11.4	11.2	*
WALLACE	316	60.6	60.8	61.3	12.5	12.0	11.1	11.3	11.7	11.6
WICHITA	32	60.7	61.8	61.5	12.0	11.1	11.6	11.4	11.1	12.7
WEST CENTRAL . . .	2,046	60.3	61.7	60.4	12.2	11.4	11.9	11.4	11.2	12.3
CLARK	20	59.8	62.5	60.7	12.7	11.8	11.8	11.6	10.6	12.5
FINNEY	269	60.2	61.8	60.2	12.4	12.0	11.8	11.1	10.7	11.9
FORD	1,237	60.3	62.5	60.4	12.7	11.9	11.4	11.6	10.8	12.3
GRANT	243	60.7	62.0	61.1	12.2	12.5	11.8	10.9	10.3	11.8
GRAY	69	60.2	62.1	60.7	12.8	12.4	11.6	11.3	10.3	11.9
HAMILTON	72	60.3	61.6	61.6	12.2	11.5	11.3	10.9	10.9	12.2
HASKELL	325	60.2	61.6	60.5	12.4	12.6	11.3	11.3	10.7	11.7
HODGEMAN	*	60.0	*	*	12.4	*	*	11.6	*	*
KEARNY	*	60.6	62.8	*	11.8	10.7	*	10.9	9.9	*
MEADE	652	60.2	61.8	60.7	12.8	12.6	12.1	11.7	11.0	12.4
MORTON	289	60.4	60.9	61.0	12.3	13.2	11.9	10.6	9.8	11.3
SEWARD	42	60.4	61.5	62.4	12.8	12.7	11.5	11.1	9.9	12.8
STANTON	439	60.3	61.1	61.2	12.3	12.4	11.4	10.7	9.9	11.3
STEVENS	121	60.4	62.0	61.7	12.6	12.7	12.3	10.8	10.3	11.8
SOUTHWEST . . .	3,778	60.3	61.9	60.9	12.5	12.2	11.6	11.2	10.4	12.0
CLAY	58	59.9	60.4	60.4	12.5	10.7	10.7	11.6	11.5	12.4
CLOUD	*	59.2	59.6	*	12.3	10.8	*	11.6	11.6	*
JEWELL	7	59.5	61.1	61.1	12.8	11.4	11.2	11.5	11.3	12.0
MITCHELL	451	59.9	60.7	60.6	12.7	11.5	11.2	11.8	11.4	12.1
OSBORNE	143	59.7	60.5	60.1	12.8	11.9	11.6	11.8	11.2	12.3
OTTAWA	*	60.0	60.6	*	12.5	11.3	*	11.3	11.4	*
PHILLIPS	256	60.0	62.0	58.5	12.6	11.6	12.5	11.1	11.0	11.2
REPUBLIC	258	59.2	60.6	60.9	12.7	11.4	11.2	11.5	11.4	12.1
ROOKS	93	59.8	61.7	57.2	12.4	11.5	12.2	11.5	11.0	11.8
SMITH	426	60.0	61.5	59.2	12.7	11.6	11.9	11.4	11.1	12.1
WASHINGTON	*	59.4	59.7	*	12.4	10.9	*	11.6	12.1	*
NORTH CENTRAL . . .	1,694	59.7	60.8	59.7	12.6	11.4	11.5	11.6	11.4	12.0
BARTON	54	59.6	61.9	61.5	12.9	12.2	12.5	11.8	11.4	13.0
DICKINSON	23	59.7	61.4	59.3	12.4	10.5	10.7	12.0	11.5	12.5
ELLIS	139	60.0	61.9	60.2	12.3	11.5	11.1	11.9	11.2	12.7
ELLSWORTH	58	59.5	62.2	61.1	12.6	11.3	10.8	11.7	11.3	13.0
LINCOLN	*	59.3	61.3	*	12.7	11.5	*	11.6	10.8	*
MCPHERSON	92	59.5	61.6	59.7	12.7	11.3	11.4	12.0	11.5	12.2
MARION	67	59.7	60.7	59.4	12.2	10.8	10.7	11.9	11.6	12.7
RICE	201	59.6	62.4	61.4	13.1	12.0	12.0	11.6	11.5	13.1
RUSH	36	60.1	61.8	60.7	12.4	11.4	11.8	11.7	11.2	12.3
RUSSELL	168	59.7	61.6	60.5	12.7	11.9	11.4	11.6	11.2	12.7
SALINE	*	60.1	61.2	*	12.4	11.5	*	11.4	11.3	*
CENTRAL	843	59.7	61.6	60.4	12.7	11.4	11.4	11.8	11.4	12.7

WEIGHT, PROTEIN, AND MOISTURE

County and District	Samples Tested 1999 <u>1/</u>	Test Weight			Protein Content <u>2/</u>			Moisture		
		Average 1987-97	1998	1999	Average 1987-97	1998	1999	Average 1987-97	1998	1999
BARBER	27	59.6	62.3	58.3	12.4	10.8	10.5	11.7	10.8	12.2
COMANCHE	*	60.1	*	*	12.5	*	*	12.0	*	*
EDWARDS	127	60.2	62.5	60.4	12.7	11.8	11.4	11.8	11.1	13.1
HARPER	*	59.1	61.2	*	12.3	10.4	*	11.9	10.5	*
HARVEY	220	59.7	62.0	60.1	12.2	11.4	11.7	12.1	11.3	12.4
KINGMAN	34	60.2	63.5	60.7	12.4	11.0	10.2	11.6	11.2	12.5
KIOWA	228	60.0	62.8	60.5	12.9	11.8	11.1	11.9	11.4	12.6
PAWNEE	509	59.6	62.1	60.3	13.1	12.0	11.9	11.5	11.4	12.7
PRATT	48	59.6	62.4	60.0	13.2	11.9	10.3	11.6	11.0	12.7
RENO	156	60.1	62.1	60.8	12.6	11.6	11.4	11.8	11.2	11.8
SEDGWICK	647	60.1	61.6	59.8	12.3	11.8	10.9	11.8	11.0	12.2
STAFFORD	*	59.7	62.9	*	13.1	11.8	*	11.7	11.4	*
SUMNER	92	59.5	61.4	59.3	12.2	11.2	10.6	11.8	11.5	12.3
SOUTH CENTRAL	2,088	59.8	62.0	60.0	12.6	11.4	10.9	11.8	11.1	12.4
ATCHISON	24	59.6	61.9	59.1	11.9	11.0	11.4	12.4	11.0	11.8
BROWN	*	59.6	60.6	*	12.1	10.5	*	12.0	13.0	*
DONIPHAN	*	*	*	*	*	*	*	*	*	*
JACKSON	*	59.2	*	*	13.4	*	*	11.5	*	*
JEFFERSON	*	58.9	*	*	14.8	*	*	12.7	*	*
LEAVENWORTH	*	*	*	*	0.0	*	*	*	*	*
MARSHALL	21	59.5	60.5	59.6	12.2	10.9	10.9	11.9	12.7	12.5
NEMAHA	*	59.6	60.4	*	12.3	10.9	*	12.3	12.9	*
POTTAWATOMIE	*	59.4	*	*	12.4	*	*	12.0	*	*
RILEY	*	60.4	*	*	12.8	*	*	8.6	*	*
WYANDOTTE	35	59.6	60.0	58.7	11.5	10.9	10.3	12.4	12.2	12.7
NORTHEAST	80	59.4	60.6	59.5	12.2	10.9	11.0	12.0	12.6	12.4
ANDERSON	*	59.6	*	*	11.4	*	*	12.0	*	*
CHASE	*	60.4	*	*	12.1	*	*	11.2	*	*
COFFEY	*	60.1	58.8	*	11.1	10.0	*	12.4	12.4	*
DOUGLAS	*	58.7	*	*	12.0	*	*	13.4	*	*
FRANKLIN	*	60.9	*	*	10.8	*	*	11.2	*	*
GEARY	*	*	*	*	*	*	*	*	*	*
JOHNSON	*	60.2	*	*	12.3	*	*	11.6	*	*
LINN	*	59.5	*	*	11.9	*	*	12.0	*	*
LYON	*	59.0	*	*	13.4	*	*	12.7	*	*
MIAMI	*	*	*	*	*	*	*	*	*	*
MORRIS	*	59.4	*	*	12.5	*	*	11.9	*	*
OSAGE	*	59.5	*	*	11.9	*	*	12.8	*	*
SHAWNEE	152	59.8	60.9	59.8	12.0	11.0	10.9	12.2	12.1	12.3
WABAUNSEE	*	59.3	*	*	13.3	*	*	11.4	*	*
EAST CENTRAL	152	59.8	60.0	59.8	12.0	10.5	10.9	12.1	12.3	12.3
ALLEN	*	*	*	*	*	*	*	*	*	0.0
BOURBON	*	59.9	*	*	10.5	10.5	*	*	*	11.4
BUTLER	20	59.1	60.1	57.4	11.9	11.9	11.0	11.0	12.0	11.9
CHAUTAUQUA	*	*	*	*	*	*	*	*	*	0.0
CHEROKEE	*	59.2	59.5	*	10.5	10.5	10.5	*	13.0	13.2
COWLEY	95	59.5	60.2	58.3	11.9	11.9	10.9	10.9	12.0	12.0
CRAWFORD	*	59.2	59.8	*	11.0	11.0	10.6	*	13.1	12.8
ELK	*	59.5	*	*	11.0	11.0	*	*	*	12.1
GREENWOOD	*	59.4	*	*	11.6	11.6	*	*	*	11.5
LABETTE	*	57.9	62.5	*	10.5	10.5	10.4	*	11.1	13.1
MONTGOMERY	*	58.6	59.4	*	11.3	11.3	10.4	*	12.8	13.0
NEOSHO	*	58.7	59.6	*	11.4	11.4	10.2	*	12.9	13.1
WILSON	53	59.2	59.7	57.4	11.4	11.4	10.7	11.1	12.6	12.7
WOODSON	*	59.6	*	*	11.0	11.0	*	*	*	12.2
SOUTHEAST	168	59.1	60.2	57.9	11.5	11.5	10.7	11.0	12.3	12.5
STATE	12,735	59.9	61.5	60.2	12.4	11.5	11.5	11.6	11.2	12.2

1/ Samples tested in 1999 represent new crop wheat moving from first point of sale in Kansas and inspected by the Kansas Grain Inspection Service, Inc through late August. Truckloads converted to carlot equivalents account for about 23 percent of the total. 2/ Adjusted to 12 percent moisture. * Not published due to insufficient data or no sample taken but included in district and State totals.

GRADES, DOCKAGE AND GRADE DEFECTS

Ninety-five percent of the 1999 wheat carlots sampled averaged number 2 or better, compared with 99 percent for 1998. Wheat grading number 1, at 61 percent, was down 27 points from the 88 percent for 1998. Samples grading number 2, at 34 percent, was up 23 points from 11 percent for 1998. The southwest district of the State had the best average, with 74 percent of the samples grading number 1. The west central district was second with 73 percent of the samples grading number 1. The southeast had the lowest average grading number 1, with 1 percent. Ninety percent of all samples had less than 0.9 percent dockage, compared with 93 percent in 1998. Total defects, at 1.6, were down from 1998, at 1.8 percent.

PERCENTAGE OF KANSAS WHEAT IN EACH GRADE

Year	District									State
	NW	WC	SW	NC	C	SC	NE	EC	SE	
Grade No. 1										
1992	62	71	70	28	16	26	31	17	6	39
1993	34	53	81	24	38	44	5	35	9	47
1994	27	56	74	28	79	60	75	70	83	57
1995	64	28	2	23	3	5	1	48	1	16
1996	48	73	64	63	60	49	19	40	36	55
1997	71	80	46	90	90	63	92	77	63	72
1998	90	92	90	81	91	88	73	80	42	88
1999	58	73	74	51	63	46	17	39	1	61
Grade No. 2										
1992	32	27	26	49	42	49	54	64	54	41
1993	53	41	18	35	45	45	38	41	59	39
1994	67	42	25	53	18	31	23	28	14	36
1995	33	61	37	55	50	34	43	34	23	43
1996	38	20	32	30	38	46	45	60	51	38
1997	20	15	47	7	8	29	8	13	29	23
1998	9	7	9	18	8	9	27	20	52	11
1999	35	26	25	38	34	47	78	60	54	34
All Other Grades										
1992	6	2	4	23	42	25	15	19	40	20
1993	13	6	1	41	17	11	57	24	32	14
1994	6	2	1	19	3	9	2	2	2	7
1995	3	11	61	22	47	61	56	18	76	41
1996	14	7	4	7	2	5	36	0	13	7
1997	9	5	7	3	2	8	0	10	8	5
1998	1	1	1	1	1	3	0	0	6	1
1999	7	1	1	11	3	7	5	1	47	5

KANSAS WHEAT DOCKAGE PERCENTAGES

Year	Number of Cars sampled 1/	Percent of Samples with Dockage				Average Dockage of Samples	
		Zero Percent	0.1-0.4 Percent	0.5-0.9 Percent	Over 0.9 Percent	Over 0.9%	All
1992	17,383	0	25	61	14	1.3	0.7
1993	15,573	0	26	57	17	1.5	0.7
1994	17,467	0	31	58	11	1.5	0.6
1995	9,879	0	14	59	27	1.7	0.9
1996	14,735	0	20	47	33	2.0	1.1
1997	19,601	0	51	39	10	4.1	0.8
1998	18,190	1	36	56	7	1.3	0.6
1999	12,735	0	47	43	10	1.4	0.6

1/ Includes truckloads converted to carlot equivalents which accounted for approximately 23 percent of the total count in 1999.

GRADE DEFECT PERCENTAGES OF KANSAS WHEAT

Year	District									State
	NW	WC	SW	NC	C	SC	NE	EC	SE	
Damaged Kernels										
1992	0.0	0.1	0.5	0.1	0.4	0.6	0.4	0.4	0.5	0.4
1993	0.1	0.1	0.1	0.5	0.3	0.2	1.8	1.3	2.0	0.3
1994	0.1	0.1	0.1	0.3	0.2	0.2	0.5	0.5	0.4	0.2
1995	0.1	0.2	0.3	0.7	0.4	0.3	2.6	0.5	0.8	0.4
1996	0.2	0.2	0.5	0.3	0.3	0.2	1.8	0.5	0.3	0.3
1997	0.1	0.2	0.2	0.0	0.1	0.2	0.2	0.3	0.1	0.1
1998	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.7	0.9	0.2
1999	0.1	0.1	0.3	0.3	0.7	0.6	0.8	0.9	1.8	0.4
Foreign Material										
1992	0.0	0.0	0.0	0.2	0.2	0.2	0.1	0.2	0.1	0.1
1993	0.1	0.0	0.0	0.1	0.2	0.3	0.1	0.2	0.2	0.1
1994	0.0	0.0	0.0	0.1	0.2	0.3	0.1	0.1	0.1	0.1
1995	0.0	0.0	0.1	0.2	0.2	0.3	0.1	0.1	0.2	0.2
1996	0.0	0.0	0.1	0.3	0.2	0.2	0.1	0.1	0.2	0.2
1997	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1
1998	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1
1999	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.1
Shrunken and Broken Kernels										
1992	1.4	1.2	1.3	1.9	1.8	1.7	1.5	1.7	1.4	1.6
1993	1.5	2.0	2.2	1.7	1.7	1.6	1.1	2.0	1.1	1.8
1994	2.3	2.3	2.3	2.1	2.0	2.0	1.3	1.5	1.3	2.1
1995	2.4	2.9	2.8	2.4	2.6	2.9	2.0	2.3	2.9	2.7
1996	1.7	1.7	1.4	1.5	1.4	1.9	1.2	1.4	1.2	1.6
1997	1.3	1.5	1.5	0.9	1.0	1.3	0.9	0.9	1.1	1.2
1998	1.4	1.7	1.9	1.3	1.4	1.6	0.8	1.0	1.2	1.5
1999	1.6	1.2	1.2	0.9	0.8	1.1	0.9	1.1	1.1	1.1
Total Defects 1/										
1992	1.4	1.3	1.8	2.2	2.4	2.5	2.0	2.3	2.0	2.1
1993	1.7	2.1	2.3	2.3	2.2	2.1	3.0	3.5	3.3	2.2
1994	2.4	2.4	2.5	2.5	2.4	2.5	1.9	2.1	1.8	2.4
1995	2.5	3.1	3.2	3.3	3.2	3.5	4.7	2.9	3.9	3.3
1996	1.9	1.9	2.0	2.1	1.9	2.3	3.1	2.0	1.7	2.1
1997	1.4	1.8	1.8	1.0	1.2	1.6	1.1	1.3	1.3	1.4
1998	1.6	2.0	2.1	1.6	1.6	1.8	1.1	1.8	2.2	1.8
1999	1.7	1.3	1.5	1.3	1.7	1.8	1.8	2.1	3.0	1.6

1/ Percentages by defect type may not add to total defects due to rounding.

WHEAT GRADES AND DOCKAGE - 1999

County and District	Grade						Dockage				Average % of Dock. Sample	
	1	2	3	4	5	Sample	Zero %	0.1-0.4%	0.5-0.9%	Over 0.9%	Over 0.9%	All
----- Percent of Total 1/- -----												
CHEYENNE	95	5	0	0	0	0	0	13	59	28	1.3	0.8
DECATUR	15	53	32	0	0	0	0	25	71	4	1.6	0.6
GRAHAM	*	*	*	*	*	*	*	*	*	*	*	*
NORTON	3	88	7	1	1	0	0	26	72	2	1.0	0.5
RAWLINS	24	76	0	0	0	0	0	10	83	7	1.1	0.7
SHERIDAN	*	*	*	*	*	*	*	*	*	*	*	*
SHERMAN	90	10	0	0	0	0	0	2	52	46	1.2	1.0
THOMAS	30	57	13	0	0	0	0	9	74	17	1.2	0.7
NORTHWEST . . .	58	35	7	0	0	0	0	9	64	27	1.2	0.7
GOVE	67	33	0	0	0	0	0	42	57	1	3.1	0.5
GREELEY	57	0	43	0	0	0	0	43	57	0	0.0	0.4
LANE	85	15	0	0	0	0	0	38	62	0	0.0	0.5
LOGAN	62	36	2	0	0	0	0	17	72	11	1.1	0.7
NESS	80	20	0	0	0	0	0	35	65	0	0.0	0.5
SCOTT	78	21	1	0	0	0	0	51	45	4	1.2	0.5
TREGO	*	*	*	*	*	*	*	*	*	*	*	*
WALLACE	99	1	0	0	0	0	0	3	89	8	1.2	0.7
WICHITA	97	3	0	0	0	0	0	41	59	0	0.0	0.5
WEST CENTRAL . .	73	26	1	0	0	0	0	32	61	7	1.7	0.5
CLARK	95	0	5	0	0	0	0	15	80	5	1.0	0.7
FINNEY	54	45	1	0	0	0	0	47	49	4	1.4	0.5
FORD	69	30	1	0	0	0	0	72	28	0	1.0	0.4
GRANT	93	7	0	0	0	0	0	33	57	10	1.1	0.6
GRAY	74	26	0	0	0	0	0	61	27	12	1.2	0.5
HAMILTON	99	1	0	0	0	0	0	18	72	10	1.0	0.6
HASKELL	65	33	2	0	0	0	0	30	62	8	1.1	0.6
HODGEMAN	*	*	*	*	*	*	*	*	*	*	*	*
KEARNY	*	*	*	*	*	*	*	*	*	*	*	*
MEADE	78	20	2	0	0	0	0	41	53	6	1.3	0.5
MORTON	89	10	1	0	0	0	0	16	75	9	1.1	0.6
SEWARD	100	0	0	0	0	0	0	81	19	0	0.0	0.3
STANTON	88	12	0	0	0	0	0	16	67	17	1.3	0.7
STEVENS	100	0	0	0	0	0	0	62	34	4	1.1	0.4
SOUTHWEST . . .	74	25	1	0	0	0	0	51	44	5	1.2	0.5
CLAY	56	40	2	2	0	0	0	45	53	2	1.0	0.5
CLOUD	*	*	*	*	*	*	*	*	*	*	*	*
JEWELL	86	0	0	14	0	0	0	100	0	0	0.0	0.3
MITCHELL	84	16	0	0	0	0	0	87	13	0	1.2	0.3
OSBORNE	48	51	1	0	0	0	0	73	26	1	1.9	0.4
OTTAWA	*	*	*	*	*	*	*	*	*	*	*	*
PHILLIPS	6	65	28	1	0	0	0	49	49	2	3.3	0.5
REPUBLIC	91	9	0	0	0	0	0	68	32	0	2.9	0.4
ROOKS	0	24	75	1	0	0	0	54	46	0	0.0	0.4
SMITH	22	66	12	0	0	0	0	80	19	1	1.2	0.4
WASHINGTON	*	*	*	*	*	*	*	*	*	*	*	*
NORTH CENTRAL .	51	38	11	0	0	0	0	74	25	1	1.8	0.4
BARTON	89	9	2	0	0	0	0	89	9	2	1.1	0.3
DICKINSON	9	91	0	0	0	0	0	87	9	4	1.1	0.4
ELLIS	59	41	0	0	0	0	0	85	15	0	0.0	0.3
ELLSWORTH	88	12	0	0	0	0	0	86	11	3	1.2	0.3
LINCOLN	*	*	*	*	*	*	*	*	*	*	*	*
MCPHERSON	27	58	15	0	0	0	4	52	41	3	1.1	0.4
MARION	14	85	1	0	0	0	0	82	15	3	2.0	0.4
RICE	93	7	0	0	0	0	0	86	14	0	0.0	0.3
RUSH	92	8	0	0	0	0	0	75	25	0	0.0	0.4
RUSSELL	68	29	2	1	0	0	0	91	9	0	0.0	0.3
SALINE	*	*	*	*	*	*	*	*	*	*	*	*
CENTRAL	63	34	3	0	0	0	1	80	18	1	1.3	0.4

WHEAT GRADES AND DOCKAGE - 1999

County and District	Grade						Dockage				Average % of Dock. Sample	
	1	2	3	4	5	Sample	Zero %	0.1-0.4%	0.5-0.9%	Over 0.9%	Over 0.9%	All
----- Percent of Total 1/-----												
BARBER	0	67	33	0	0	0	0	48	4	48	2.6	1.4
COMANCHE	*	*	*	*	*	*	*	*	*	*	*	*
EDWARDS	80	19	0	1	0	0	0	83	17	0	0.0	0.3
HARPER	*	*	*	*	*	*	*	*	*	*	*	*
HARVEY	43	51	6	0	0	0	0	84	11	5	1.2	0.3
KINGMAN	79	21	0	0	0	0	3	82	15	0	0.0	0.3
KIOWA	80	19	1	0	0	0	0	75	24	1	1.2	0.4
PAWNEE	63	34	2	1	0	0	0	71	27	2	1.2	0.4
PRATT	48	44	6	2	0	0	2	69	27	2	1.2	0.4
RENO	60	26	11	3	0	0	0	35	62	3	1.1	0.6
SEDGWICK	37	57	6	0	0	0	0	55	31	14	1.7	0.6
STAFFORD	*	*	*	*	*	*	*	*	*	*	*	*
SUMNER	11	78	11	0	0	0	0	15	23	62	1.7	1.3
SOUTH CENTRAL	46	47	6	1	0	0	0	57	30	13	1.5	0.7
ATCHISON	4	63	25	8	0	0	0	79	17	4	1.7	0.4
BROWN	*	*	*	*	*	*	*	*	*	*	*	*
DONIPHAN	*	*	*	*	*	*	*	*	*	*	*	*
JACKSON	*	*	*	*	*	*	*	*	*	*	*	*
JEFFERSON	*	*	*	*	*	*	*	*	*	*	*	*
LEAVENWORTH	*	*	*	*	*	*	*	*	*	*	*	*
MARSHALL	19	81	0	0	0	0	0	38	57	5	1.2	0.5
NEMAHA	*	*	*	*	*	*	*	*	*	*	*	*
POTTAWATOMIE	*	*	*	*	*	*	*	*	*	*	*	*
RILEY	*	*	*	*	*	*	*	*	*	*	*	*
WYANDOTTE	11	63	26	0	0	0	0	34	57	9	1.5	0.6
NORTHEAST	17	78	4	1	0	0	0	44	51	5	1.3	0.5
ANDERSON	*	*	*	*	*	*	*	*	*	*	*	*
CHASE	*	*	*	*	*	*	*	*	*	*	*	*
COFFEY	*	*	*	*	*	*	*	*	*	*	*	*
DOUGLAS	*	*	*	*	*	*	*	*	*	*	*	*
FRANKLIN	*	*	*	*	*	*	*	*	*	*	*	*
GEARY	*	*	*	*	*	*	*	*	*	*	*	*
JOHNSON	*	*	*	*	*	*	*	*	*	*	*	*
LINN	*	*	*	*	*	*	*	*	*	*	*	*
LYON	*	*	*	*	*	*	*	*	*	*	*	*
MIAMI	*	*	*	*	*	*	*	*	*	*	*	*
MORRIS	*	*	*	*	*	*	*	*	*	*	*	*
OSAGE	*	*	*	*	*	*	*	*	*	*	*	*
SHAWNEE	39	60	1	0	0	0	0	84	15	1	1.4	0.3
WABAUNSEE	*	*	*	*	*	*	*	*	*	*	*	*
EAST CENTRAL	39	60	1	0	0	0	0	84	15	1	1.4	0.3
ALLEN	*	*	*	*	*	*	*	*	*	*	*	*
BOURBON	*	*	*	*	*	*	*	*	*	*	*	*
BUTLER	0	25	70	5	0	0	0	15	5	80	2.2	1.9
CHAUTAUQUA	*	*	*	*	*	*	*	*	*	*	*	*
CHEROKEE	*	*	*	*	*	*	*	*	*	*	*	*
COWLEY	0	64	35	1	0	0	2	36	20	42	2.4	1.2
CRAWFORD	*	*	*	*	*	*	*	*	*	*	*	*
ELK	*	*	*	*	*	*	*	*	*	*	*	*
GREENWOOD	*	*	*	*	*	*	*	*	*	*	*	*
LABETTE	*	*	*	*	*	*	*	*	*	*	*	*
MONTGOMERY	*	*	*	*	*	*	*	*	*	*	*	*
NEOSHO	*	*	*	*	*	*	*	*	*	*	*	*
WILSON	0	19	73	8	0	0	0	70	28	2	1.1	0.4
WOODSON	*	*	*	*	*	*	*	*	*	*	*	*
SOUTHEAST	1	54	43	2	0	0	2	39	20	39	2.1	1.3
STATE	61	34	5	0	0	0	0	47	43	10	1.4	0.6

1/ May not add due to rounding. *Not published due to insufficient data or no sample taken, but included in district and State totals.

GRADE DEFECT PERCENTAGES

County & District	Samples Tested 1999 1/	Total Damaged Kernels			Foreign Material			Shrunken & Broken Kernels			Total Defects 2/		
		Average 1987-96	1998	1999	Average 1987-96	1998	1999	Average 1987-96	1998	1999	Average 1987-96	1998	1999
CHEYENNE	246	0.1	0.5	0.1	0.0	0.0	0.0	2.0	1.8	1.9	2.2	2.3	2.0
DECATUR	234	0.1	0.3	0.1	0.1	0.1	0.0	1.8	1.3	1.4	2.0	1.6	1.5
GRAHAM	*	0.2	0.0	*	0.1	0.0	*	2.0	0.0	*	2.4	0.0	*
NORTON	193	0.1	0.2	0.2	0.1	0.0	0.1	1.8	1.3	1.3	2.0	1.5	1.6
RAWLINS	136	0.1	0.1	0.1	0.1	0.0	0.0	2.1	1.6	1.6	2.2	1.7	1.7
SHERIDAN	*	0.1	0.0	*	0.1	0.0	*	2.1	0.0	*	2.2	0.0	*
SHERMAN	717	0.1	0.1	0.0	0.0	0.0	0.0	2.0	1.5	1.8	2.1	1.7	1.9
THOMAS	360	0.1	0.1	0.1	0.0	0.1	0.0	2.0	1.5	1.5	2.2	1.6	1.6
NORTHWEST	1,886	0.1	0.2	0.1	0.0	0.0	0.0	2.0	1.4	1.6	2.1	1.6	1.7
GOVE	239	0.1	0.1	0.1	0.0	0.0	0.0	2.0	1.4	1.0	2.1	1.6	1.1
GREELEY	7	0.4	0.6	0.0	0.1	0.0	0.0	2.0	1.9	1.0	2.5	2.5	1.0
LANE	13	0.3	0.2	0.2	0.0	0.1	0.0	2.2	2.0	1.2	2.4	2.2	1.4
LOGAN	743	0.0	0.1	0.0	0.0	0.0	0.0	1.9	1.4	1.4	2.0	1.5	1.5
NESS	20	0.3	0.1	0.3	0.0	0.0	0.1	2.1	2.0	1.0	2.4	2.1	1.3
SCOTT	676	0.2	0.2	0.2	0.0	0.0	0.0	1.9	1.7	1.3	2.1	1.9	1.6
TREGO	*	0.2	0.5	*	0.1	0.0	*	2.2	1.6	*	2.5	2.0	*
WALLACE	316	0.1	0.3	0.2	0.0	0.0	0.0	1.9	1.6	1.6	2.0	1.9	1.8
WICHITA	32	0.2	0.1	0.1	0.0	0.0	0.0	2.1	1.8	1.1	2.3	2.0	1.2
WEST CENTRAL	2,046	0.2	0.2	0.1	0.0	0.0	0.0	2.0	1.7	1.2	2.2	2.0	1.3
CLARK	20	0.5	0.2	0.4	0.1	*	0.1	2.1	2.2	1.0	2.6	2.4	1.5
FINNEY	269	0.2	0.1	0.3	0.1	*	0.0	1.9	2.1	1.0	2.1	2.2	1.3
FORD	1,237	0.3	0.2	0.3	0.1	0.1	0.1	2.0	1.9	1.0	2.4	2.2	1.3
GRANT	243	0.3	0.2	0.3	*	0.1	0.1	2.1	1.9	1.3	2.5	2.1	1.6
GRAY	69	0.3	0.1	0.3	*	*	0.0	1.9	1.9	1.0	2.2	2.0	1.3
HAMILTON	72	0.3	0.3	0.2	0.1	*	0.0	2.1	1.9	1.4	2.5	2.3	1.7
HASKELL	325	0.4	0.1	0.6	*	*	0.0	1.7	1.6	1.3	2.1	1.7	1.9
HODGEMAN	*	1.0	*	*	0.1	*	*	2.0	0.0	*	3.1	*	*
KEARNY	*	0.2	0.1	*	0.1	*	*	1.9	0.9	*	2.1	0.9	*
MEADE	652	0.6	0.5	0.4	0.1	0.1	0.1	1.9	1.8	1.0	2.5	2.3	1.4
MORTON	289	0.4	0.2	0.2	0.1	*	*	2.1	2.4	1.6	2.6	2.6	1.8
SEWARD	42	0.3	0.1	0.3	0.1	*	0.0	1.9	2.0	1.0	2.3	2.2	1.3
STANTON	439	0.3	0.1	0.2	*	*	0.0	2.2	2.4	1.6	2.5	2.6	1.8
STEVENS	121	0.4	0.2	0.3	*	*	0.0	2.0	2.0	1.1	2.4	2.2	1.3
SOUTHWEST	3,778	0.4	0.2	0.3	0.1	*	0.0	2.0	1.9	1.2	2.4	2.1	1.5
CLAY	58	0.2	0.1	0.4	0.2	0.1	0.2	2.1	1.3	0.9	2.4	1.6	1.4
CLOUD	*	0.3	0.1	*	0.2	0.1	*	2.1	1.2	*	2.6	1.3	*
JEWELL	7	0.3	0.1	0.4	0.2	0.1	0.3	1.8	1.3	0.9	2.3	1.4	1.6
MITCHELL	451	0.2	0.1	0.3	0.2	0.1	0.1	1.8	1.4	0.8	2.2	1.6	1.2
OSBORNE	143	0.3	0.2	0.2	0.2	0.1	0.1	1.8	1.5	1.0	2.3	1.8	1.3
OTTAWA	*	0.1	0.1	*	0.2	0.5	*	1.8	1.3	*	2.1	2.0	*
PHILLIPS	256	0.2	0.1	0.4	0.1	0.0	0.0	1.8	1.4	1.1	2.1	1.5	1.6
REPUBLIC	258	0.6	0.1	0.4	0.2	0.1	0.1	1.9	1.3	1.0	2.6	1.5	1.5
ROOKS	93	0.1	0.2	0.2	0.1	0.0	*	1.7	1.4	0.9	1.9	1.6	1.1
SMITH	426	0.2	0.1	0.1	0.1	0.0	*	1.6	1.4	0.9	1.9	1.5	1.1
WASHINGTON	*	0.7	0.3	*	0.1	0.0	*	1.8	1.0	*	2.6	1.2	*
NORTH CENTRAL	1,694	0.3	0.1	0.3	0.2	0.1	0.1	1.8	1.3	0.9	2.3	1.6	1.3
BARTON	54	0.6	0.1	0.8	0.2	0.1	0.1	1.9	1.4	0.6	2.7	1.5	1.6
DICKINSON	23	0.2	0.0	0.8	0.2	0.1	0.1	1.6	1.3	1.1	2.0	1.5	2.1
ELLIS	139	0.2	0.2	0.4	0.1	0.1	0.1	2.0	1.4	0.8	2.3	1.7	1.4
ELLSWORTH	58	0.2	0.1	0.5	0.1	0.1	0.2	1.9	1.3	0.7	2.3	1.4	1.3
LINCOLN	*	0.3	0.1	*	0.2	0.0	*	1.9	1.4	*	2.4	1.5	*
MCPHERSON	92	0.4	0.2	1.2	0.3	0.1	0.2	1.6	1.3	1.0	2.2	1.6	2.4
MARION	67	0.4	0.1	1.1	0.2	0.1	0.1	1.7	1.5	1.0	2.3	1.7	2.2
RICE	201	0.9	0.0	0.8	0.1	0.1	0.1	1.5	1.2	0.7	2.6	1.3	1.6
RUSH	36	0.5	0.1	0.7	0.1	0.1	0.1	2.0	1.6	0.7	2.5	1.8	1.4
RUSSELL	168	0.3	0.1	0.4	0.1	0.0	0.1	2.0	1.6	0.8	2.4	1.8	1.3
SALINE	*	0.5	0.3	*	0.2	0.2	*	2.0	1.4	*	2.7	1.9	*
CENTRAL	843	0.5	0.1	0.7	0.2	0.1	0.2	1.8	1.4	0.8	2.4	1.6	1.7

GRADE DEFECT PERCENTAGES

County & District	Samples Tested 1999 1/	Total Damaged Kernels			Foreign Material			Shrunken & Broken Kernels			Total Defects 2/		
		Average 1987-96	1998	1999	Average 1987-96	1998	1999	Average 1987-96	1998	1999	Average 1987-96	1998	1999
BARBER	27	0.4	0.1	0.0	0.2	0.1	0.1	2.0	1.6	1.0	2.6	1.8	1.1
COMANCHE	*	0.4	0.0	*	0.2	0.0	*	1.9	0.0	*	2.4	0.0	*
EDWARDS	127	0.4	0.1	0.2	0.1	0.0	0.0	1.8	1.7	0.8	2.3	1.8	1.1
HARPER	*	0.3	0.0	*	0.4	0.3	*	2.0	1.8	*	2.6	2.2	*
HARVEY	220	0.5	0.1	0.9	0.2	0.0	0.1	1.5	1.4	1.0	2.2	1.5	1.9
KINGMAN	34	0.2	0.1	0.4	0.3	0.1	0.2	1.7	1.5	1.0	2.2	1.6	1.5
KIOWA	228	0.5	0.1	0.2	0.1	0.1	0.1	1.7	1.5	0.9	2.3	1.6	1.2
PAWNEE	509	0.3	0.1	0.7	0.1	0.1	0.1	1.9	1.5	0.9	2.3	1.7	1.7
PRATT	48	0.7	0.1	0.4	0.2	0.2	0.3	1.8	1.6	1.1	2.6	1.9	1.8
RENO	156	0.6	0.3	1.2	0.3	0.3	0.3	1.9	1.5	1.5	2.7	2.1	3.1
SEDGWICK	647	0.5	0.1	0.4	0.3	0.1	0.1	1.9	1.6	1.1	2.6	1.8	1.7
STAFFORD	*	0.7	0.0	*	0.2	0.2	*	1.7	1.2	*	2.5	1.5	*
SUMNER	92	0.2	0.0	0.6	0.3	0.2	0.1	1.9	1.5	1.0	2.4	1.7	1.7
SOUTH	2,088	0.4	0.1	0.6	0.2	0.1	0.2	1.8	1.6	1.1	2.5	1.8	1.8
ATCHISON	24	0.8	0.2	2.0	0.1	0.0	0.1	1.3	1.2	1.2	2.3	1.4	3.3
BROWN	*	1.1	0.5	*	0.1	0.0	*	1.2	0.7	*	2.3	1.2	*
DONIPHAN	*	0.0	0.0	*	0.0	0.0	*	0.0	0.0	*	0.0	0.0	*
JACKSON	*	0.5	0.0	*	0.1	0.0	*	0.8	0.0	*	1.4	0.0	*
JEFFERSON	*	0.2	0.0	*	0.1	0.0	*	1.2	0.0	*	1.5	0.0	*
LEAVENWORTH	*	0.0	0.0	*	0.0	0.0	*	0.0	0.0	*	0.0	0.0	*
MARSHALL	21	0.8	0.2	0.6	0.1	0.0	0.1	1.5	0.7	0.9	2.3	1.0	1.6
NEMAH	*	1.0	0.2	*	0.1	0.1	*	1.7	0.9	*	2.8	1.2	*
POTTAWATOMIE	*	0.5	0.0	*	0.1	0.0	*	1.3	0.0	*	1.8	0.0	*
RILEY	*	0.2	0.0	*	0.1	0.0	*	2.3	0.0	*	2.6	0.0	*
WYANDOTTE	35	1.3	0.9	1.3	0.1	0.1	0.2	1.6	1.0	0.8	2.9	1.9	2.3
NORTHEAST	80	1.0	0.3	0.8	0.1	0.0	0.1	1.5	0.8	0.9	2.5	1.1	1.8
ANDERSON	*	0.7	*	*	*	*	*	0.6	*	*	1.3	*	*
CHASE	*	0.1	*	*	*	*	*	2.0	*	*	2.2	*	*
COFFEY	*	0.5	0.5	*	0.1	0.1	*	1.2	1.1	*	1.8	*	*
DOUGLAS	*	1.5	*	*	0.1	*	*	1.1	*	*	2.7	*	*
FRANKLIN	*	0.5	*	*	0.1	*	*	1.4	*	*	2.0	*	*
GEARY	*	0.0	*	*	0.0	*	*	0.0	*	*	0.0	*	*
JOHNSON	*	0.6	*	*	0.1	*	*	1.7	*	*	2.4	*	*
LINN	*	0.5	*	*	0.2	*	*	1.3	*	*	2.0	*	*
LYON	*	0.9	*	*	0.2	*	*	1.2	*	*	2.3	*	*
MIAMI	*	*	*	*	*	*	*	*	*	*	*	*	*
MORRIS	*	0.3	*	*	0.2	*	*	1.8	*	*	2.3	*	*
OSAGE	*	0.8	*	*	0.2	*	*	1.2	*	*	2.2	*	*
SHAWNEE	152	0.7	0.2	0.9	0.2	*	0.1	1.8	1.3	1.1	2.6	1.6	2.1
WABAUNSEE	*	0.6	0.0	*	0.2	*	*	2.4	*	*	3.1	*	*
EAST CENTRAL	152	0.6	0.7	0.9	0.1	0.1	0.1	1.6	1.0	1.1	2.3	1.8	2.1
ALLEN	*	*	*	*	*	*	*	*	*	*	*	*	*
BOURBON	*	0.6	0.0	.	0.1	0.0	.	1.7	0.0	.	2.3	0.0	.
BUTLER	20	0.2	0.1	0.7	0.2	0.1	0.2	1.6	1.5	1.1	2.0	1.6	1.9
CHAUTAUQUA	*	*	*	*	*	*	*	*	*	*	*	*	*
CHEROKEE	*	1.0	1.9	*	0.1	0.1	*	1.1	0.9	*	2.1	2.9	*
COWLEY	95	0.3	0.0	1.8	0.2	0.1	0.2	1.6	1.6	1.1	2.1	1.7	3.1
CRAWFORD	*	1.1	3.7	*	0.1	0.1	*	1.2	0.7	*	2.3	4.5	*
ELK	*	0.5	*	*	0.2	*	*	1.2	*	*	1.8	*	*
GREENWOOD	*	0.5	*	*	0.2	*	*	1.3	*	*	2.0	*	*
LABETTE	*	0.6	0.0	*	0.1	0.1	*	1.4	1.3	*	2.1	1.5	*
MONTGOMERY	*	0.8	1.9	*	0.1	0.1	*	1.5	0.9	*	2.5	2.9	*
NEOSHO	*	0.8	0.9	*	0.1	0.1	*	1.3	1.0	*	2.2	2.0	*
WILSON	53	0.5	0.5	3.2	0.1	0.1	0.2	1.4	1.1	0.9	2.0	1.7	4.2
WOODSON	*	0.4	*	*	0.1	*	*	1.3	*	*	1.8	*	*
SOUTHEAST	168	0.6	0.9	1.8	0.1	0.1	0.1	1.4	1.2	1.1	2.2	2.2	3.0
STATE	12,735	0.4	0.2	0.4	0.1	0.1	0.1	1.9	1.5	1.1	2.3	1.8	1.6

1/ Samples tested in 1999 represent new crop wheat moving from first point of sale in Kansas and inspected by the Kansas Grain Inspection Service Inc. through late August. Truckloads converted to carlot equivalents account for about 23 percent of the total. 2/ Percentages by defect may not add to total due to rounding. * Not published due to insufficient data or no sample taken included in district and State totals.

KANSAS WHEAT VARIETIES - 1999 CROP

Jagger was the leading variety of wheat seeded in Kansas for the 1999 crop, according to Kansas Agricultural Statistics. Jagger gained popularity in all districts, accounting for 29.2 percent of the State's wheat. The KSU maintained variety 2137 ranked second overall, with 22.0 percent of the acreage. It ranked first or second in the eastern two-thirds of the State and gained favor with producers in the western one-third as well. TAM 107 remained in third position, with 8.3 percent of the acreage. TAM 107 was the dominant variety planted in the western third of the State. Karl and improved Karl continued the fourth leading variety seeded in Kansas, but dropped to 5.9 percent of the acreage Statewide. The fifth most popular variety was Ike, with 5.5 percent of the State's acreage. The KSU maintained variety 2163 ranked in the top five varieties in all but the western districts of the State, and accounted for 3.4 percent. Seventh was AGSECO 7853, with 1.9 percent. Larned held on to eighth, also with 1.9 percent. Rounding out the top ten was AgriPro Coronado and AgriPro Tomahawk, with 1.3 percent and 1.2 percent respectively. Blends were used more extensively in the central one third of the State, accounting for 6.1 percent of the acres planted Statewide.

DISTRIBUTION OF KANSAS WINTER WHEAT VARIETIES, SPECIFIED YEARS

VARIETY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
PERCENT OF SEEDED ACREAGE										
Jagger	-	-	-	-	-	-	1.0	6.4	20.2	29.2
2137	-	-	-	-	-	-	-	1.0	13.5	22.0
TAM 107	14.7	15.4	18.3	19.8	19.0	20.6	17.1	17.0	12.6	8.3
Karl/Karl 92	0.7	5.9	11.5	23.0	23.6	22.4	20.9	22.1	10.8	5.9
Ike	-	-	-	-	-	0.9	7.2	10.5	7.0	5.5
2163	0.8	2.6	4.6	9.0	13.8	17.1	19.8	15.4	10.4	3.4
AGSECO-7853	-	-	0.2	1.4	2.1	3.7	4.6	4.0	3.4	1.9
Larned	10.7	11.6	8.9	8.3	8.3	7.6	4.8	3.6	2.4	1.9
AgriPro Coronado	-	-	-	-	-	-	-	-	0.8	1.3
AgriPro Tomahawk	-	-	-	1.5	6.2	7.0	4.7	3.1	1.8	1.2
AgriPro Pecos	-	-	-	-	0.2	1.1	1.8	1.6	1.6	0.9
Vista	-	-	-	-	-	0.3	0.8	1.2	1.1	0.9
Akron-HRW	-	-	-	-	-	-	-	-	0.4	0.8
Dominator	-	-	-	-	-	-	-	-	0.2	0.8
AgriPro Ogalala	-	-	-	-	-	0.2	1.5	1.3	0.8	0.7
Scout/Scout 66	1.9	1.6	1.8	1.3	1.3	1.0	1.2	0.8	0.7	0.5
TAM 110	-	-	-	-	-	-	-	-	-	0.5
AgPro Abilene	0.6	3.9	4.7	2.2	1.1	0.6	0.5	0.4	0.1	0.4
AgriPro Big Dawg	-	-	-	-	-	-	-	-	0.2	0.4
Arapahoe	0.1	0.1	0.3	0.2	0.8	0.8	1.0	1.1	0.5	0.4
Newton	8.3	7.6	5.8	3.1	2.5	1.6	1.3	0.6	0.3	0.4
AgriPro Victory	7.7	8.2	10.2	8.1	3.9	2.2	1.1	0.7	0.6	0.3
Champ	-	-	-	-	-	-	-	0.4	0.5	0.3
Eagle	1.6	1.1	1.6	1.0	1.1	1.1	0.6	0.5	0.4	0.3
TAM 105	0.9	1.1	1.0	0.6	0.6	-	-	-	-	0.3
AgriPro Hickock	-	-	-	-	-	-	0.3	1.0	0.6	0.2
AgriPro Laredo	-	-	-	-	-	0.8	0.6	0.6	0.2	0.2
AgriPro Thunderbird	9.3	9.0	7.5	5.5	3.4	2.6	1.5	1.0	0.5	0.2
AGSECO Mankato	-	-	-	-	-	-	-	-	0.2	0.2
Blends	-	-	-	-	-	-	-	-	2.6	6.1
Other Hard Varieties	42.0	31.2	23.4	14.7	11.7	8.3	7.5	5.4	5.6	4.6
Other Soft Varieties	0.7	0.7	0.2	0.3	0.4	0.1	0.2	0.3	0.0	0.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

WHEAT QUALITY PROFILE - MILLING RESULTS

SURVEY AND PROJECT PROCEDURES

The wheat quality profile is a joint project of the Kansas State University Department of Grain Science and Industry and Kansas Agricultural Statistics. This report provides additional information for the evaluation of the milling and baking characteristics of Kansas wheat, and makes available some meaningful comparisons with previous years. Historic data are shown at the end of this bulletin for selected characteristics for the period 1986-96.

Users of these data should recognize that there are some limitations in making inferences from the results. Sample size is a limiting factor for some varieties and quality characteristics. However, one of the major indications the survey provides is quality factors by variety. This information should be useful in evaluating the milling and flour qualities of the different varieties as produced in farm fields as well as comparing variety data with that summarized in previous Wheat Quality publications.

SAMPLE COLLECTION

Wheat from which the quality profile data were developed was collected as a part of the regular Wheat Objective Yield Survey program of Kansas Agricultural Statistics. Survey samples were distributed proportionally to the acreage grown in each area of the State with a total of 310 sample units selected. Two small plots were laid out in each field for observation during the growing season. Plant and head counts were made within the plots about May 1, June 1, and July 1. Enumerators were instructed to return to each sample field immediately prior to harvest (normally within seven days) to clip the wheat heads within the sample plots. These heads were sent to the Kansas Agricultural Statistics lab in Topeka for threshing and the yield per acre was computed. Wheat for the quality profile testing was also collected from these sample fields. If a sample was abandoned or lost, an alternate sample was collected from the immediate area. Based on average head weight and quantities needed for laboratory analysis, about 1,000 grams of grain were collected from each sample field.

QUALITY TESTS

The threshed grain was sent to the Department of Grain Science and Industry at Kansas State University for quality analysis.

Moisture and protein contents, test weight, 1,000 kernel weight, kernel size distribution, degree of softening, and falling number were determined on the individual samples.

The individual samples were then composited by districts in order to provide sufficient grain and flour for reliable milling and dough testing. When there were several samples of the same variety from a district, equal weights of that variety were composited. A mixed variety composite was made for each district using equal weights of any remaining varieties. The resulting flours were used for chemical and rheological tests.

DESCRIPTION OF TESTING PROCEDURES

MARKETING TESTS

Wheat grades are based on tests conducted by inspectors who are licensed and supervised by the Federal Grain Inspection Service (FGIS). These tests determine the physical and biological condition of the grain. They include test weight, moisture and protein contents, presence of diseased and damaged kernels, unmillable material, and sanitary condition.

Flour millers perform additional tests to determine specific qualities desired for milling and baking. A major portion of Kansas hard red winter wheat is milled into flour for large wholesale bread bakeries.

The following test descriptions are intended as an aid in interpreting the tables on the following pages. For additional information on hard red winter wheat quality analysis, see "Evaluating Bread Wheat" published by the Wheat Quality Council, P.O. Box 966, Pierre, SD 57501-0966.

PROTEIN

The protein test is used to predict the quantity of gluten and not the quality. The protein content of wheat or flour is predicted by determining the percent of nitrogen using the combustion nitrogen analysis (CNA) method, then multiplying by an appropriate conversion factor. Combustion nitrogen analysis involves combusting a sample in pure oxygen, collecting the combustion gases, then analyzing the gases for nitrogen content by measuring the thermal conductivity of the gases.

Wheat protein content is reported on a 12% moisture basis while flour protein content is reported on a 14% moisture basis.

Protein content of commercially milled flour averages about 1% less than the wheat from which it was milled. Flour for pan bread is usually milled from wheats having at least 12% to 13% protein. Hearth breads and hard rolls usually require higher protein content flour.

SINGLE KERNEL CHARACTERIZATION SYSTEM (SKCS)

The SKCS unit directly measures physical characteristics of wheat such as kernel hardness, kernel diameter, and kernel weight. Measurements are made on 300 individual kernels of wheat, and the single kernel average and standard deviation (uniformity) are calculated. Additionally, a classification such as "Hard", "Mixed", or "Soft" is assigned. Single kernel weight value is highly correlated with the One Thousand Kernel Weight value.

TEST WEIGHT PER BUSHEL

This test determines the weight per Winchester bushel of a sample under controlled conditions. Determinations were made using a one quart kettle for 1000 grams, or for small samples, a 1/8 quart kettle and 125 grams of wheat. This method is described in Circular No. 921 issued by the United States Department of Agriculture.

There is a correlation between the test weight and the yield of straight grade flour from a sample. Straight grade flour is a blend of all the flour streams from each grinding operation in the mill. As the test weight increases, the expected yield of flour also increases.

The test weight of wheat decreases as moisture is added. This decrease is the result of:

- 1) the lower specific gravity of water as compared to wheat
- 2) the swelling of the kernels as water is absorbed

If the wetted wheat is redried, it doesn't regain the original test weight because the kernel is unable to shrink after swelling and the roughened bran coat prevents close packing of the kernels. Shriveled kernels also show a decreased test weight because of their inability to pack tightly.

A low test weight is a strong indicator of unsound wheat. This test, used along with the 1000 kernel weight and the wheat size tests, provides an estimate of milling extraction (flour yield).

HECTOLITER WEIGHT

To convert test weight in pounds per Winchester bushel (lb/bu) to kilograms per hectoliter (kg/hl), the following formula is used:

$$\text{kg/hl} = (1.292 \times \text{lb/bu}) + 1.419$$

This is a change for 1999. The formula used in previous years was: $\text{kg/hl} = \text{lb/bu} \times 1.287$.

1000 KERNEL WEIGHT (TKW)

An electronic seed counter is used to count 40 grams of cleaned whole kernels of wheat. Kernel weight is reported in grams per 1000 kernels on a 12% moisture basis.

The percentage of endosperm in wheat kernels of the same variety is normally greater in larger than in smaller wheat kernels. Plump kernels of wheat weigh more; and therefore, have a higher 1000 kernel weight which suggests good milling extraction. However, this conclusion must be substantiated by the test weight and wheat size tests.

WHEAT KERNEL (SIZE) DISTRIBUTION

Kernel size distribution is determined by sifting 200 grams of wheat over wire mesh screens of two different sizes (7w and 9w) for one minute.

Higher percentages over the 7w represent larger, plumper kernels containing a large percentage of endosperm indicating a higher potential flour yield. Factors such as wetting or scouring will affect the outcome of this test. Wetting will increase the size of the wheat kernels. Although the kernels are larger, the milling extraction will remain the same. On the other hand, scouring will decrease the size of the wheat kernels by removing the dust and smoothing the bran of the kernels. Although the theoretical yield is lower, the milling extraction is unchanged. To eliminate false conclusions, the wheat size test should be used in conjunction with the test weight and 1000 kernel weight tests.

MOISTURE

The measurement of moisture in wheat and flour is important because:

- 1) wheat cannot be safely stored above 12-13 percent moisture
- 2) moisture has a bearing on flour yield in milling
- 3) all analysis must be on a common moisture basis to be compared

Wheat moisture is measured using a Motomco Moisture Meter. The Motomco Moisture Meter works on the principle of capacitance. The capacitance is greater in water than in the rest of the kernel; as a result, the increase in capacitance can be related to the water content. Moisture calibration of the Motomco is checked with the Air Oven Method (AACC Method 44-15A). Moisture content is calculated from the loss in weight which occurs during oven drying at 130° C for one hour.

LABORATORY MILLING

The composited wheat samples were conditioned by adding enough water to bring the moisture content to 15.0% approximately 24 hours prior to milling. Each composited sample was milled on a Brabender Quadrumat Senior laboratory flour mill. Four products were obtained from each milling: break flour, reduction flour, bran, and shorts. Total flour extraction (yield) was expressed as percentage of the total products recovered from the mill.

The percent of ash, or mineral content (AACC Method 08-01), is given with the flour extraction as an additional measure of milling performance. The bran coat normally contains about ten times the amount of ash as the endosperm. As the level of extraction increases, the ash content typically increases indicating that more bran material was ground into flour. Different wheats also have varying amounts of ash content in the endosperm, depending on the variety and the growing conditions. A wheat with good milling characteristics gives a high yield of low ash flour.

WET GLUTEN

Ten grams of ground wheat meal and 5.2 milliliters of 2 percent salt solution are mixed in the Glutomatic test chamber for 20 seconds. The gluten is then washed for 5 minutes and a separation of gluten and soluble starch is obtained. The gluten ball is then divided and placed in a centrifuge for 1 minute to remove excess water. The weight of the centrifuged gluten x 10 = Percent Wet Gluten.

DRY GLUTEN

The gluten from the wet gluten process above is placed between two heated Teflon-coated plates for approximately 4 minutes. The weight of the dry gluten x 10 = Percent Dry Gluten.

FALLING NUMBER (AACC Method 56-81B)

The falling number test is used to detect sprout damage in wheat. Wet weather during harvest causes sprouting and the release of starch-liquefying enzymes. These enzymes are very active at high temperatures and may cause the baked product to be gummy inside or the flour in gravies and soups to break down.

The falling number test is relatively simple. The falling number value is the number of seconds from the time of immersion of the test tube in boiling water until the stirrer-viscometer has fallen a prescribed distance through a flour paste. As the amount of sprouted wheat increases, the falling number decreases.

There is an optimum falling number value for each flour use.

FARINOGRAPH AND MIXOGRAPH

The mixograph and farinograph measure and record the resistance to mixing of a flour and water dough. The recording, or curve, rises to a “peak” as the flour proteins are developed into a three dimensional structure (gluten) and then falls as the gluten is broken down by continued mixing.

Time required for a mixograph or farinograph curve to reach the “peak” is an estimate of the amount of mixing required to properly develop the dough for bread baking. The rate at which the curve falls and narrows after the peak, and stability of curve height on either side of the peak are indicators of tolerance to over-mixing. Curves made by the two instruments are not directly comparable.

The water absorption values obtained with the farinograph and mixograph provide estimates of water required for baking. Absorption usually increases as protein content increases.

Large mechanized bakeries require flour with high water absorption, medium-long mixing requirement, and adequate mixing tolerance.

Flours with low mixing requirement usually lack mixing tolerance. Flours with excessive mixing requirement have good tolerance but increase bakery energy costs, disrupt production schedules, and may cause machining problems which results in inferior loaves which cannot be sold.

The following information is derived from the mixograph test (AACC Method 54-40A):

Absorption: The percentage of water required to produce an optimum mixogram. Too much water produces a curve that dips during the development stage; too little water causes the curve to be very wide.

Peak (Mixing) Time: The time required for the dough to reach full development. This time can be determined from the intersection of lines drawn through the center of both sides of the curve. The time (minutes) from the start of the curve to the intersection of the two lines is the optimum mixing time.

Mixing Tolerance: There is no standard measure of mixograph mixing tolerance. A dough with poor mixing tolerance will produce a curve with a very sharp peak followed by an immediate decrease in width and height of the curve. A dough with good mixing tolerance will produce a curve with a gradual peak that maintains its width and height after the peak.

Information derived from the farinograph test (AACC Method 54-21,A) include:

Absorption: This is the percentage of water required to center the curve on the 500 Brabender Unit (B.U.) line at the maximum consistency of the dough (Peak). Absorption is reported on a 14% moisture basis.

Peak (Mixing) Time: This is the time required for the curve to reach its full development or maximum consistency. Long peak times are usually associated with strong wheats.

Stability (Tolerance): This is the time that the curve remains above the 500 B.U. line and is measured from the arrival time to the departure time. The longer the stability, the greater the abuse and the longer the fermentation a flour is able to withstand.

Degree of Softening: This is another indicator of mixing tolerance of the dough. Given in Brabender units, it measures the breakdown of the dough 12 minutes after the peak mixing time. Lower values are better as they indicate greater tolerance.

WHEAT QUALITY PROFILE - 1999 CROP

INDIVIDUAL SAMPLES

Area & Variety	No. of Samples	Protein 12% M.B.	Test Weight		1,000 K.W. 12% M.B.	Wheat Size Test <u>1/</u>			SKCS Hardness	Falling Number <u>2/</u>
						Over 7W	Over 9W	Thru 9W		
		Pct.	Lb/Bu	Kg/Hl	Grams	- - - Percent - - -			Seconds	
NORTHWEST										
2137	5	11.8	59.4	78.2	29.6	58.8	40.7	0.6	69.3	325.0
IKE	4	13.6	59.9	78.8	27.0	43.4	55.5	1.2	60.9	244.0
JAGGER	6	13.6	59.3	78.0	26.2	44.9	53.7	1.5	71.6	275.0
TAM 107	4	12.0	61.3	80.7	32.7	67.3	32.5	0.3	70.3	384.0
OTHER	17	12.2	60.3	79.4	28.2	48.8	50.4	0.9	70.9	341.0
ALL VARIETIES	36	12.5	60.1	79.1	28.4	51.0	48.2	0.9	69.6	322.0
MINIMUM	-	10.0	54.5	71.8	21.6	22.6	11.4	0.1	52.1	75.0
MAXIMUM	-	15.1	66.0	86.7	40.3	88.6	75.7	2.7	85.8	454.0
WEST CENTRAL										
2137	5	11.2	60.6	79.7	30.1	59.6	39.8	0.7	63.1	390.0
IKE	4	11.2	60.9	80.1	30.1	53.9	45.5	0.6	64.2	287.0
TAM 107	9	11.3	59.1	77.7	31.7	66.3	32.5	1.2	61.8	383.0
OTHER	8	11.0	60.9	80.1	30.1	61.2	38.3	0.6	66.4	350.0
ALL VARIETIES	26	11.2	60.2	79.2	30.7	61.6	37.7	0.8	63.8	359.0
MINIMUM	-	9.3	56.3	74.2	25.9	32.8	8.9	0.0	51.1	223.0
MAXIMUM	-	13.3	63.6	83.6	41.4	91.1	65.8	5.7	78.5	421.0
SOUTHWEST										
2137	5	11.9	62.1	81.6	31.4	62.3	37.1	0.7	65.9	408.0
IKE	6	12.9	59.7	78.6	29.1	45.7	53.7	0.8	63.6	346.0
JAGGER	14	13.1	59.0	77.7	27.6	49.0	49.8	1.3	70.4	407.0
LARNED	3	10.9	60.8	80.0	31.6	70.4	29.1	0.6	62.0	338.0
TAM 107	12	11.8	59.4	78.1	29.7	59.8	39.5	0.8	69.5	388.0
OTHER	12	11.6	60.9	80.1	30.4	61.2	38.3	0.6	66.6	333.0
ALL VARIETIES	52	12.2	60.0	78.9	29.5	56.3	42.9	0.9	67.6	375.0
MINIMUM	-	9.5	55.0	72.4	22.1	12.8	15.0	0.0	50.5	188.0
MAXIMUM	-	16.7	65.0	85.4	35.9	85.0	86.2	4.0	87.3	463.0
NORTH CENTRAL										
2137	9	10.4	59.4	78.2	30.3	70.2	28.8	1.1	54.0	399.0
2163	5	10.6	58.9	77.6	30.2	72.4	26.8	0.9	49.6	402.0
JAGGER	7	12.2	59.4	78.2	27.5	49.8	49.0	1.3	71.9	419.0
KARL 92	3	11.2	58.4	76.9	28.7	54.1	44.9	1.1	53.2	369.0
OTHER	18	11.7	59.5	78.3	29.3	60.5	38.6	0.9	61.1	355.0
ALL VARIETIES	42	11.4	59.3	78.1	29.3	61.8	37.3	1.0	59.5	382.0
MINIMUM	-	9.6	52.3	69.0	21.4	21.3	11.1	0.1	43.4	105.0
MAXIMUM	-	14.5	62.6	82.2	35.2	88.7	77.4	3.8	82.0	456.0
CENTRAL										
2137	12	11.8	61.0	80.2	33.6	79.2	20.3	0.6	58.3	388.0
2163	3	11.1	60.1	79.0	31.8	73.6	26.1	0.3	59.9	366.0
JAGGER	17	11.5	59.2	77.9	30.9	70.4	29.0	0.6	62.2	356.0
VICTORY	3	10.5	58.2	76.6	32.3	73.9	25.7	0.5	54.9	357.0
OTHER	13	12.1	60.2	79.2	30.9	69.1	30.5	0.6	57.8	331.0
ALL VARIETIES	48	11.7	59.9	78.8	31.7	72.7	26.8	0.6	59.4	358.0
MINIMUM	-	9.5	56.5	74.4	26.1	37.4	6.0	0.0	49.7	196.0
MAXIMUM	-	15.0	65.7	86.3	41.8	94.0	61.4	2.5	79.5	447.0

WHEAT QUALITY PROFILE - 1999 CROP

INDIVIDUAL SAMPLES

Area & Variety	No. of Samples	Protein 12% M.B.	Test Weight		1,000 K.W. 12% M.B.	Wheat Size Test <u>1/</u>			SKCS Hardness	Falling Number <u>2/</u>
						Over 7W	Over 9W	Thru 9W		
		Pct.	Lb/Bu	Kg/Hl	Grams	- - - Percent - - -			Seconds	
SOUTH CENTRAL										
2137	18	10.4	58.8	77.4	31.1	72.7	26.7	0.7	53.4	372.0
2163	3	12.5	59.6	78.4	26.9	51.4	47.4	1.3	66.4	407.0
JAGGER	32	10.8	58.8	77.4	29.9	67.4	31.8	0.8	60.3	383.0
OTHER	24	10.5	58.7	77.2	30.3	69.7	29.5	0.9	56.5	352.0
ALL VARIETIES	85	10.7	58.8	77.4	30.0	68.0	31.3	0.8	58.1	376.0
MINIMUM	-	8.9	49.7	65.6	42.7	34.7	9.0	0.1	43.9	211.0
MAXIMUM	-	13.5	61.7	81.2	36.9	90.9	64.4	3.4	78.7	471.0
NORTHEAST										
KARL 92	3	10.0	59.3	78.0	29.3	62.8	36.5	0.7	57.8	393.0
OTHER	4	11.0	59.4	78.2	25.9	46.5	51.7	2.0	62.2	397.0
ALL VARIETIES	7	10.6	59.4	78.1	27.4	53.5	45.2	1.4	60.3	395.0
MINIMUM	-	9.2	56.1	73.9	23.2	32.1	27.2	0.4	54.6	366.0
MAXIMUM	-	12.5	61.3	80.7	31.2	72.1	65.9	4.0	70.9	425.0
EAST CENTRAL										
OTHER	5	10.9	60.0	78.9	30.8	70.0	29.2	0.9	65.6	364.0
ALL VARIETIES	5	10.9	60.0	78.9	30.8	70.0	29.2	0.9	65.6	364.0
MINIMUM	-	9.5	58.3	76.7	28.0	49.8	21.4	0.5	58.5	211.0
MAXIMUM	-	12.7	62.4	82.1	34.7	78.2	48.8	1.5	78.5	424.0
SOUTHEAST										
OTHER	6	10.4	57.1	75.2	29.3	67.5	31.4	1.2	62.8	308.0
ALL VARIETIES	6	10.4	57.1	75.2	29.3	67.5	31.4	1.2	62.8	308.0
MINIMUM	-	9.6	55.1	72.6	26.5	57.9	19.7	0.8	55.8	286.0
MAXIMUM	-	11.1	58.3	76.8	32.5	79.5	40.7	1.5	66.7	347.0
STATE										
2137	59	11.0	59.8	78.7	31.2	70.3	29.1	0.7	58.4	376.0
2163	15	11.2	59.5	78.2	29.8	67.4	31.8	0.9	59.7	384.0
AKRON	4	11.2	61.1	80.3	29.8	54.8	44.4	1.0	71.8	379.0
ARAPAHO	3	12.8	56.6	34.6	24.8	36.0	62.1	2.0	62.8	362.0
IKE	18	12.6	60.2	79.1	29.1	50.3	49.0	0.8	62.0	291.0
JAGGER	80	11.7	59.0	77.6	29.1	61.3	37.8	1.0	64.8	374.0
KARL 92	12	11.1	59.8	78.7	30.6	63.0	36.4	0.7	58.2	366.0
LARNED	3	10.9	60.8	80.0	31.6	70.4	29.1	0.6	62.0	338.0
TAM 107	26	11.7	59.5	78.3	30.8	62.9	36.3	0.9	66.8	385.0
VICTORY	4	10.9	59.1	77.7	31.4	66.0	33.6	0.6	59.3	369.0
OTHER	73	11.3	59.8	78.6	29.7	62.9	36.3	0.8	61.7	349.0
ALL VARIETIES	307	11.4	59.5	78.3	29.9	63.1	36.2	0.9	62.2	365.0
MINIMUM	-	8.9	49.7	65.6	21.4	12.8	6.0	0.0	43.4	75.0
MAXIMUM	-	16.7	66.0	86.7	41.8	94.0	86.2	5.7	87.3	471.0

1/ May not add to 100 percent due to rounding. 2/ 14% moisture base.

WHEAT QUALITY PROFILE - 1999 CROP

COMPOSITED SAMPLES

Area & Variety	Prot. 12% M.B.	Test Weight		1,000 K.W. 12% M.B.	Wheat Size Test <u>1</u> /			Wheat Data		Milling Data		Flour Data
					Over 7W	Over 9W	Thru 9W	Gluten		Extr-action	Ash 14% M.B.	Flour Protein <u>2</u> /
								Wet	Dry			

	Pct.	Lb/Bu	Kg/Hl	Grams	-----	Percent	-----	Percent		-----	Percent	-----
NORTHWEST												
2137	12.1	59.4	78.1	27.6	51.7	47.6	0.8	31.0	11.4	68.4	0.4	10.3
MIKE	13.8	60.1	79.1	26.8	43.6	55.2	1.2	33.6	13.0	68.4	0.4	12.0
JAGGER	13.7	57.3	75.5	25.8	44.9	54.0	1.2	35.6	14.3	68.0	0.5	11.7
TAM 107	12.1	61.8	81.3	32.1	67.3	32.7	0.1	30.3	10.9	70.3	0.4	10.4
BLEND	12.5	60.9	80.1	27.5	48.6	50.7	0.8	30.8	11.6	69.4	0.5	10.5
ALL VARIETIES	12.8	59.9	78.8	28.0	51.2	48.0	0.8	32.3	12.2	68.9	0.4	11.0
WEST CENTRAL												
2137	11.1	61.1	80.3	29.0	59.7	39.9	0.5	28.8	9.9	71.0	0.5	9.7
MIKE	10.9	61.4	80.7	29.5	54.0	45.4	0.6	25.9	9.4	69.5	0.4	9.6
TAM 107	11.5	59.4	78.2	30.7	66.3	33.2	0.6	27.5	9.6	70.4	0.4	9.8
BLEND	10.9	61.1	80.4	29.9	61.9	37.9	0.3	24.9	8.9	70.0	0.4	9.4
ALL VARIETIES	11.1	60.8	79.9	29.8	60.5	39.1	0.5	26.8	9.5	70.2	0.4	9.6
SOUTHWEST												
2137	12.0	62.0	81.5	30.5	62.6	36.9	0.6	29.2	10.3	69.6	0.4	10.2
MIKE	12.9	60.1	79.0	28.3	50.7	48.9	0.5	32.1	12.3	69.4	0.4	11.3
JAGGER	13.3	59.2	77.9	27.1	51.8	47.1	1.2	34.5	13.7	69.8	0.5	11.4
TAM 107	11.8	59.6	78.4	29.5	60.6	38.8	0.7	30.9	10.9	69.7	0.4	10.2
BLEND	11.7	61.2	80.4	30.4	64.1	35.6	0.3	30.5	11.2	69.7	0.5	9.9
ALL VARIETIES	12.1	60.5	79.6	29.6	59.9	39.5	0.7	32.0	12.0	69.8	0.5	10.4
NORTH CENTRAL												
2137	10.7	59.6	78.5	28.7	65.8	33.0	1.3	26.2	8.8	67.5	0.4	8.8
JAGGER	12.4	59.8	78.7	26.8	49.8	49.0	1.3	29.7	10.6	68.3	0.5	10.5
KARL 92	11.4	59.3	78.1	28.8	59.6	39.8	0.7	28.2	9.8	68.2	0.4	9.5
BLEND	12.0	60.0	78.9	29.3	61.1	38.4	0.6	30.5	11.4	69.2	0.4	10.1
ALL VARIETIES	11.4	59.6	78.4	28.8	61.9	37.3	0.9	28.0	10.0	68.4	0.4	9.6
CENTRAL												
2137	11.9	61.4	80.7	33.3	80.0	19.7	0.4	29.1	10.6	69.0	0.4	10.0
JAGGER	11.7	60.0	79.0	30.6	69.3	30.2	0.6	26.3	9.1	67.2	0.4	9.7
KARL 92	11.3	60.5	79.6	33.2	80.4	19.2	0.5	24.4	8.8	68.2	0.4	9.4
BLEND	12.2	60.6	79.7	30.0	67.5	31.9	0.7	30.2	11.1	68.6	0.4	10.3
ALL VARIETIES	11.5	60.4	79.4	31.8	74.4	25.2	0.5	26.8	9.5	68.1	0.4	9.6

WHEAT QUALITY PROFILE - 1999 CROP

COMPOSITED SAMPLES

Area & Variety	Prot. 12% M.B.	Test Weight		1,000 K.W. 12% M.B.	Wheat Size Test <u>1</u> /			Wheat Data		Milling Data		Flour Data
					Over 7W	Over 9W	Thru 9W	Gluten		Extr- action	Ash 14% M.B.	Flour Protein <u>2</u> /
								Wet	Dry			
	Pct.	Lb/Bu	Kg/Hl	Grams	- - - -	Percent	- - - -	Percent		- - -	Percent	- - -
SOUTH CENTRAL												
2137	10.7	59.5	78.3	31.1	72.8	26.5	0.8	24.4	8.1	66.8	0.4	8.9
JAGGER	11.0	59.7	78.5	29.8	66.6	32.5	0.9	25.4	8.7	68.2	0.4	9.2
BLEND	10.9	59.5	78.3	29.8	68.2	31.2	0.6	26.4	9.1	68.1	0.4	9.0
ALL VARIETIES	11.3	59.7	78.5	29.3	65.0	34.1	1.0	26.6	9.2	67.7	0.4	9.4
NORTHEAST												
KARL 92	10.1	60.0	78.9	29.9	63.4	36.2	0.5	23.7	8.2	67.3	0.4	8.6
BLEND	11.2	59.6	78.4	26.2	50.2	48.5	1.4	26.6	9.0	66.9	0.4	9.2
ALL VARIETIES	10.7	59.8	78.7	28.1	56.8	42.4	1.0	25.2	8.6	67.1	0.4	8.9
EAST CENTRAL												
BLEND	11.4	60.3	79.3	30.9	68.9	30.2	1.0	26.8	9.3	68.7	0.5	9.6
ALL VARIETIES	11.4	60.3	79.3	30.9	68.9	30.2	1.0	26.8	9.3	68.7	0.5	9.6
SOUTHEAST												
BLEND	10.5	57.9	76.2	28.6	66.2	32.9	0.9	23.1	8.0	65.5	0.5	8.6
ALL VARIETIES	10.5	57.9	76.2	28.6	66.2	32.9	0.9	23.1	8.0	65.5	0.5	8.6
STATE												
2137	11.4	60.5	79.6	30.0	65.4	33.9	0.7	28.1	9.9	68.7	0.4	9.7
IKE	12.5	60.5	79.6	28.2	49.4	49.8	0.8	30.5	11.6	69.1	0.4	11.0
JAGGER	12.4	59.2	77.9	28.0	56.5	42.6	1.0	30.3	11.3	68.3	0.5	10.5
KARL 92	10.9	59.9	78.9	30.6	67.8	31.7	0.6	25.4	8.9	67.9	0.4	9.2
TAM 107	11.8	60.3	79.3	30.8	64.7	34.9	0.5	29.6	10.5	70.1	0.4	10.1
BLEND	11.5	60.1	79.1	29.2	61.9	37.5	0.7	27.8	10.0	68.5	0.4	9.6
ALL VARIETIES	11.6	60.1	79.0	29.4	62.0	37.3	0.8	28.5	10.3	68.7	0.4	9.9

1/ May not add to 100 percent due to rounding. 2/ 14% moisture base. 3/ All other varieties with insufficient grain available for separate tests.

WHEAT QUALITY PROFILE - 1999 CROP

PHYSICAL DOUGH TEST BY COMPOSITED SAMPLES

Area & Variety	Physical Dough Test					
	Mixograph		Farinograph			
	Absorption	Peak Time	Absorption	Peak Time	Stability	Softening
	Percent	Minutes	Percent	----- Minutes -----		Degree
NORTHWEST						
2137	61.5	3.1	55.4	4.2	19	34
IKE	66.5	5.2	56.6	10.4	23	36
JAGGER	65.5	3.6	57.2	5.7	15	58
TAM 107	59.5	3.5	56.1	7.7	19	40
BLEND	61.5	4.0	55.8	2.5	19	33
ALL VARIETIES	62.9	3.9	56.2	6.1	19	40
WEST CENTRAL						
2137	59.5	3.5	54.1	2.1	17	41
IKE	59.5	3.7	54.7	2.7	14	45
TAM 107	57.5	3.5	56.7	2.3	19	30
BLEND	59.5	4.0	54.9	2.1	19	34
ALL VARIETIES	59.0	3.7	55.1	2.3	17	38
SOUTHWEST						
2137	59.5	4.0	54.1	3.3	25	22
IKE	63.5	5.0	56.6	10.8	28	15
JAGGER	63.5	4.0	56.8	8.6	21	38
TAM 107	59.5	3.6	56.3	5.0	19	24
BLEND	61.5	4.0	54.9	2.5	19	23
ALL VARIETIES	61.5	3.9	55.9	6.0	21	30
NORTH CENTRAL						
2137	56.5	4.2	52.9	1.6	8	69
JAGGER	61.5	4.5	55.0	2.3	19	33
KARL 92	59.5	5.6	53.2	2.0	15	49
BLEND	61.5	5.1	53.9	2.5	17	47
ALL VARIETIES	59.3	4.5	53.6	2.1	14	49
CENTRAL						
2137	59.5	4.4	54.3	2.5	17	43
JAGGER	59.5	4.0	55.0	2.5	13	47
KARL 92	57.5	4.5	53.8	2.1	11	56
BLEND	61.5	4.5	54.5	2.7	16	42
ALL VARIETIES	58.7	4.3	54.3	2.3	15	52
SOUTH CENTRAL						
2137	56.5	4.1	54.1	1.6	9	60
JAGGER	59.5	4.5	54.5	2.0	13	49
BLEND	56.5	4.0	54.6	1.8	10	56
ALL VARIETIES	58.0	4.1	54.0	1.9	13	49
NORTHEAST						
KARL 92	55.5	4.9	53.5	1.8	5	81
BLEND	57.5	4.3	54.5	1.8	8	55
ALL VARIETIES	56.5	4.6	54.0	1.8	7	68
EAST CENTRAL						
BLEND	59.5	4.4	55.1	2.1	10	61
ALL VARIETIES	59.5	4.4	55.1	2.1	10	61
SOUTHEAST						
BLEND	56.5	4.4	55.2	1.8	6	75
ALL VARIETIES	56.5	4.4	55.2	1.8	6	75
STATE						
2137	58.8	3.9	54.2	2.6	16	45
IKE	63.2	4.6	56.0	8.0	22	32
JAGGER	61.9	4.1	55.7	4.2	16	45
KARL 92	57.5	5.0	53.5	2.0	11	62
TAM 107	58.8	3.5	56.4	5.0	19	31
BLEND	59.5	4.3	54.8	2.2	14	47
ALL VARIETIES	59.7	4.1	54.9	3.4	16	45

1/ All other varieties with insufficient grain available for separate tests.

WHEAT QUALITY PROFILE, 1998-99

RANGES FOR PROTEIN CONTENT - 12% M.B. (MOISTURE BASIS) 1/

Year	Less than 9.0	9.0-9.9	10.0-10.9	11.0-11.9	12.0-12.9	13.0 and Over	State Avg.
----- Percent of Samples -----							
1998	2.0	14.3	27.4	23.5	18.6	14.3	11.4
1999	.3	12.6	31.4	21.7	18.4	15.5	11.5

RANGES FOR TEST WEIGHT - KILOGRAMS/HECTOLITER 1/

Year	Less than 70.0	70.0-71.9	72.0-73.9	74.0-75.9	76.0-77.9	78.0-79.9	80.0-81.9	82.0 & Over	State Avg.
----- Percent of Samples -----									
1998	-	-	2.6	5.2	8.5	25.1	29.0	29.6	61.1
1999	.6	.3	4.9	9.7	27.5	28.8	20.1	8.1	78.3

RANGES FOR FALLING NUMBER - SECONDS 1/

Year	Less than 180	180-299	300-399	400-419	420 and Over	State Avg.
----- Percent of Samples -----						
1998	-	5.2	79.8	11.7	3.3	374
1999	1.6	13.6	48.2	17.8	18.8	365

1/ May not add to 100 percent due to rounding.

WHEAT QUALITY PROFILE, 1990-99

Year	Number of Samples	Wheat Analysis							SKCS Hardness <u>2/</u>
		Protein % 12% M.B.	Test Weight		1,000 Kernels	Wheat Size <u>1/</u>			
					12% M.B.	Over 7W	Over 9W	Thru 9W	
			Lb./Bu.	Kg./Hl.	Grams	----- Percent -----			
1990	269	12.1	61.3	79.0	27.8	52.4	44.7	3.0	N/A
1991	276	12.6	60.4	77.7	27.8	46.4	51.7	2.0	64.3
1992	275	12.0	60.4	77.7	29.2	55.2	43.3	1.6	65.7
1993	273	11.3	60.6	78.0	29.0	50.3	48.3	1.5	68.6
1994	274	12.3	61.3	78.9	27.4	45.1	53.0	1.9	69.3
1995	271	12.4	58.7	75.6	25.3	38.0	58.7	3.3	57.0
1996	274	13.8	60.2	77.5	28.3	50.4	48.2	1.5	62.9
1997	301	11.9	60.4	79.5 <u>3/</u>	30.3	60.2	38.8	1.0	44.5
1998	307	11.4	61.1	80.4	29.1	54.9	43.7	1.4	67.8
1999	307	11.4	59.5	78.3	29.9	63.1	36.2	0.9	62.2

1/ May not add to 100 percent due to rounding. 2/ NIR hardness started in 1991. It changed to SKCS hardness in 1998.

3/ New conversion procedures for 1997 on as noted on page 23.

Year	Number of Samples <u>1/</u>	Wet Gluten 14% M.B. <u>2/</u>	Dry Gluten 14% M.B. <u>2/</u>	Falling Number	Physical Dough Test				
					Farinograph				
					Absorption	Peak Time	Stability	Valorimeter	Softening
----- Percent -----		Seconds	Percent	----- Minutes -----		Degree			
1990	269	29.0	10.5	322	55.4	5.2	13	63	N/A
1991	276	29.8	11.3	N/A	55.9	5.7	15	66	N/A
1992	275	29.1	10.8	N/A	58.8	5.8	13	66	N/A
1993	273	25.1	9.8	N/A	54.9	5.6	16	63	N/A
1994	274	28.7	10.8	N/A	56.1	6.3	17	68	N/A
1995	271	30.4	11.1	N/A	56.6	5.7	13	64	N/A
1996	274	32.4	12.6	N/A	57.8	6.1	11	67	N/A
1997	301	24.5	9.5	N/A	55.2	4.2	13	62	N/A
1998	307	25.3	10.6	N/A	57.7	4.0	12	59	N/A
1999	307	28.5	10.3	363	54.9	3.4	16	N/A	45

1/ Compositated samples. 14% moisture base. See page 21. 2/ Gluten is for flour in 1988-1996. Beginning in 1997, Gluten is for wheat.

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